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=> d his nofile

     (FILE 'HOME' ENTERED AT 14:37:18 ON 25 SEP 2003)

     FILE 'HCA' ENTERED AT 14:38:12 ON 25 SEP 2003
               E US2002016912/PN
               E US20020160912/PN
L1           1 SEA ABB=ON  PLU=ON  US2002160912/PN
               D SCAN
               SEL L1 RN

     FILE 'REGISTRY' ENTERED AT 14:39:02 ON 25 SEP 2003
L2           4 SEA ABB=ON  PLU=ON  (12036-32-7/BI OR 12036-41-8/BI OR
               1306-38-3/BI OR 1308-96-9/BI)
               D SCAN
               E AL2O3/MF
L3           8 SEA ABB=ON  PLU=ON  AL2O3/MF
               E O2SI/MF
L4          48 SEA ABB=ON  PLU=ON  O2SI/MF
               E O2TI/MF
L5          17 SEA ABB=ON  PLU=ON  O2TI/MF
               E LA2O3/MF
L6          21 SEA ABB=ON  PLU=ON  LA2O3.MO/MF
               E O3Y2/MF
L7           3 SEA ABB=ON  PLU=ON  O3Y2/MF
               E O2ZR/MF
L8          14 SEA ABB=ON  PLU=ON  O2ZR/MF

     FILE 'HCA' ENTERED AT 14:54:04 ON 25 SEP 2003
L9       22120 SEA ABB=ON  PLU=ON  L2
L10     230410 SEA ABB=ON  PLU=ON  L3
L11     341510 SEA ABB=ON  PLU=ON  L4
L12     125137 SEA ABB=ON  PLU=ON  L5
L13         33 SEA ABB=ON  PLU=ON  L6
L14      33397 SEA ABB=ON  PLU=ON  L7
L15      76426 SEA ABB=ON  PLU=ON  L8
L16     592472 SEA ABB=ON  PLU=ON  L10 OR L11 OR L12
L17      93156 SEA ABB=ON  PLU=ON  L13 OR L14 OR L15

     FILE 'LCA' ENTERED AT 14:56:15 ON 25 SEP 2003
L18         70 SEA ABB=ON  PLU=ON  (CE OR CERIUM# OR EUROPIUM# OR EU OR PR OR
               PRASEODYMIUN# OR TERBIUM# OR TB)(A)(OXIDE# OR DIOXIDE# OR
               DI(W)OXIDE#) OR CEO2 OR EU2O3 OR PR2O3 OR TB2O3
L19       2810 SEA ABB=ON  PLU=ON  (AL OR ALUMINUM# OR SI OR SILICON# OR TI
               OR TITANIUM#)(A)(OXIDE# OR DIOXIDE# OR DI(W)OXIDE#) OR SIO2 OR
               AL2O3 OR TIO2 OR SILICA?
L20        239 SEA ABB=ON  PLU=ON  (LA OR LANTHANUM# OR Y OR YTTRIUM OR ZR OR
               ZIRCONIUM#)(A)(OXIDE# OR DIOXIDE# OR DI(W)OXIDE#) OR LA2O3 OR
               ZRO2 OR Y2O3 OR ZIRCONIA#

     FILE 'HCA' ENTERED AT 15:06:20 ON 25 SEP 2003
L21      35489 SEA ABB=ON  PLU=ON  L9 OR L18
L22    1185889 SEA ABB=ON  PLU=ON  L19 OR L16
L23     198183 SEA ABB=ON  PLU=ON  L17 OR L20
L24    1328934 SEA ABB=ON  PLU=ON  CATALY? OR ACTIVATOR? OR ACCELERANT? OR
               ENHANCER? OR ACCELERAT!R?
L25      14949 SEA ABB=ON  PLU=ON  L21 AND L22
L26       8286 SEA ABB=ON  PLU=ON  L25 AND L23
L27       2167 SEA ABB=ON  PLU=ON  L26 AND L24
               E CATALYST+ALL/IT
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L28       615453 SEA ABB=ON  PLU=ON  CATALYST/IT
L29         1963 SEA ABB=ON  PLU=ON  L26 AND L28

     FILE 'LCA' ENTERED AT 15:10:34 ON 25 SEP 2003
L30              QUE ABB=ON  PLU=ON  PARTICL? OR MICROPARTICL? OR PARTICULAT?
                 OR DUST? OR GRIT? OR GRAIN# OR GRANUL? OR POWDER? OR SOOT? OR
                 SMUT? OR FINES# OR PRILL? OR FLAKE# OR PELLET? OR BB#
L31           706 SEA ABB=ON  PLU=ON  FINE# OR ULTRAFINE# OR ULTRA(W)FINE#
L32             1 SEA ABB=ON  PLU=ON  (OXYGEN OR O2)(2A)(STOR? OR HELD? OR HOLD?
                 OR RETAIN?)

     FILE 'HCA' ENTERED AT 15:14:18 ON 25 SEP 2003
L33           437 SEA ABB=ON  PLU=ON  L29 AND L30
L34            38 SEA ABB=ON  PLU=ON  L33 AND L31
L35          2434 SEA ABB=ON  PLU=ON  (OXYGEN OR O2)(2A)(STOR? OR HELD? OR HOLD?
                 OR RETAIN?)
L36            58 SEA ABB=ON  PLU=ON  L27 AND L35

     FILE 'LREGISTRY' ENTERED AT 15:15:51 ON 25 SEP 2003

     FILE 'LCA' ENTERED AT 15:18:04 ON 25 SEP 2003
L37         32336 SEA ABB=ON  PLU=ON  PRODUC? OR PROD# OR GENERAT? OR MANUF? OR
                 MFR# OR CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE# OR
                 MADE# OR MAKIN# OR FABRICAT? OR SYNTHESI? OR PREPAR? OR PREP#

     FILE 'HCA' ENTERED AT 15:19:12 ON 25 SEP 2003
L38            40 SEA ABB=ON  PLU=ON  L36 AND L37
L39        242884 SEA ABB=ON  PLU=ON  CERIA# OR ALUMINA#
L40            38 SEA ABB=ON  PLU=ON  L38 AND L39
L41            40 SEA ABB=ON  PLU=ON  L38 OR L40
L42            26 SEA ABB=ON  PLU=ON  L41 AND 1907-2000/PY,PRY
L43            33 SEA ABB=ON  PLU=ON  L41 AND 1907-2001/PY,PRY
L44             0 SEA ABB=ON  PLU=ON  L42 NOT L43
L45             7 SEA ABB=ON  PLU=ON  L43 NOT L42
                 D SCAN

     FILE 'LCA' ENTERED AT 15:22:44 ON 25 SEP 2003
L46            12 SEA ABB=ON  PLU=ON  (PRASEODYMIUM# OR PR)(2A)(OXIDE# OR
                 DIOXIDE# OR DI(W)OXIDE#)

     FILE 'HCA' ENTERED AT 15:33:57 ON 25 SEP 2003
L47          9371 SEA ABB=ON  PLU=ON  (PRASEODYMIUM# OR PR)(2A)(OXIDE# OR
                 DIOXIDE# OR DI(W)OXIDE#)
L48             7 SEA ABB=ON  PLU=ON  L42 AND L47
L49             0 SEA ABB=ON  PLU=ON  L45 AND L47
L50            26 SEA ABB=ON  PLU=ON  L42 OR L48
L51         41317 SEA ABB=ON  PLU=ON  L9 OR L18 OR L47
L52         41886 SEA ABB=ON  PLU=ON  L51 OR CERIA#
L53         16002 SEA ABB=ON  PLU=ON  L52 AND (L22 OR ALUMINA# OR TITANIA# OR
                 SILICA#)
L54          8748 SEA ABB=ON  PLU=ON  L53 AND L23
L55          2167 SEA ABB=ON  PLU=ON  L54 AND L27
L56          1589 SEA ABB=ON  PLU=ON  L55 AND L37
L57         11586 SEA ABB=ON  PLU=ON  (OXYGEN OR O2)(2A)(STOR? OR HELD? OR HOLD?
                 OR RETAIN? OR ADSORB? OR ABSORB?)
L58            48 SEA ABB=ON  PLU=ON  L56 AND L57
L59            17 SEA ABB=ON  PLU=ON  L58 AND L30
L60             5 SEA ABB=ON  PLU=ON  L59 AND L31
L61            17 SEA ABB=ON  PLU=ON  L59 OR L60
L62             8 SEA ABB=ON  PLU=ON  L61 AND 1907-2000/PY,PRY
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L63          12 SEA ABB=ON  PLU=ON  L61 AND 1907-2001/PY,PRY
L64          26 SEA ABB=ON  PLU=ON  L50 OR L62
L65          16 SEA ABB=ON  PLU=ON  L45 OR L63

     FILE 'WPIX' ENTERED AT 15:43:42 ON 25 SEP 2003
L66        6992 SEA ABB=ON  PLU=ON  L18 OR L46
L67      314268 SEA ABB=ON  PLU=ON  (L22 OR ALUMINA# OR TITANIA# OR SILICA#)
L68       36096 SEA ABB=ON  PLU=ON  (LA OR LANTHANUM# OR Y OR YTTRIUM OR ZR OR
                ZIRCONIUM#)(A)(OXIDE# OR DIOXIDE# OR DI(W)OXIDE#) OR LA2O3 OR
                ZRO2 OR Y2O3 OR ZIRCONIA#
L69        2141 SEA ABB=ON  PLU=ON  L66 AND L67 AND L68
L70         441 SEA ABB=ON  PLU=ON  L69 AND L24
L71        4891 SEA ABB=ON  PLU=ON  (OXYGEN OR O2)(2A)(STOR? OR HELD? OR HOLD?
                OR RETAIN? OR ADSORB? OR ABSORB?)
L72          21 SEA ABB=ON  PLU=ON  L70 AND L71

     FILE 'HCA, WPIX' ENTERED AT 15:48:37 ON 25 SEP 2003
L73          52 DUP REM L64 L65 L72 (11 DUPLICATES REMOVED)
L74          66 DUP REM L58 L72 (3 DUPLICATES REMOVED)
L75          45 SEA ABB=ON  PLU=ON  L72 AND L73
                SET MSTEPS ON
L76          26 SEA L73
L77           8 SEA L73
L78          27 SEA ABB=ON  PLU=ON  L72 AND (L76 OR L77)
L79          18 SEA L73
L80          18 SEA ABB=ON  PLU=ON  L72 AND L79
     TOTAL FOR ALL FILES
L81          45 SEA ABB=ON  PLU=ON  L72 AND L73
L82          26 SEA L73
L83           8 SEA L73
L84          34 SEA ABB=ON  PLU=ON  (L82 OR L83) AND L24
L85          18 SEA L73
L86          18 SEA ABB=ON  PLU=ON  L85 AND L24
     TOTAL FOR ALL FILES
L87          52 SEA ABB=ON  PLU=ON  L73 AND L24
L88          48 SEA L74
L89          48 SEA ABB=ON  PLU=ON  L88 AND L24
L90          18 SEA L74
L91          18 SEA ABB=ON  PLU=ON  L90 AND L24
     TOTAL FOR ALL FILES
L92          66 SEA ABB=ON  PLU=ON  L74 AND L24

     FILE 'HCA, WPIX' ENTERED AT 15:52:23 ON 25 SEP 2003
L93          26 SEA L73
L94           8 SEA L73
L95          34 SEA ABB=ON  PLU=ON  (L93 OR L94) AND L24
L96          18 SEA L73
L97          18 SEA ABB=ON  PLU=ON  L96 AND L24
     TOTAL FOR ALL FILES
L98          52 SEA ABB=ON  PLU=ON  L73 AND L24
L99          10 SEA ABB=ON  PLU=ON  L97 AND 2001-2003/PY
     TOTAL FOR ALL FILES
L100         10 SEA ABB=ON  PLU=ON  L97 AND 2001-2003/PY
L101          8 SEA ABB=ON  PLU=ON  L97 NOT L99
     TOTAL FOR ALL FILES
L102          8 SEA ABB=ON  PLU=ON  L97 NOT L100
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This set of answers should all have good dates.

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=> d L64 1-26 cbib abs hitind hitrn

L64 ANSWER 1 OF 26 HCA COPYRIGHT 2003 ACS on STN
136:204543 Close-coupled **catalyst** for purifying exhaust gas and process for its **manufacture**.. Lindner, Dieter; Mussmann, Lothar; Votsmeier, Martin; Lox, Egbert; Kreuzer, Thomas (Omg A.-G. & Co. K.-G., Germany). Eur. Pat. Appl. EP 1181970 A1 20020227, 11 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (German). CODEN: EPXXDW. APPLICATION: EP 2000-117618 20000816.

AB The invention relates to a start-up **catalytic** converter for purifying exhaust gases resulting from an internal combustion engine where the **catalyst** consists of palladium on **aluminum oxide** and from barium oxide. For the **catalyst** barium oxide and palladium are deposited together onto the substrate material of **aluminum oxide** in **fine** dispersion and the medium **particle** size of the palladium crystals is between 3 and 7. The small cryst. size of the palladium and the finely dispersed barium oxide deposited on the substrate enable the **catalyst** to maintain high activity and long term stability while stressed at high temp. The start-up **catalyst** may also have a second **catalytically** active coating which contains platinum and rhodium on **alumina** stabilized by lanthana as an **oxygen** a **storage** component applied onto the first **catalytically** active coating.

IC ICM B01D053-94
ICS B01J023-58

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST close coupled **catalyst** exhaust gas purifn

IT Exhaust gas **catalytic** converters
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT Hydrocarbons, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT **Catalyst** supports
(honeycomb, ceramic or metal; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT Exhaust gases (engine)
(internal combustion engine; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT **1306-38-3, Ceria**, uses 1312-81-8, Lanthana **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(**alumina** stabilizer; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT 1304-28-5, Barium oxide, uses **1344-28-1, Aluminum oxide**, uses 7440-05-3, Palladium, uses **12036-32-7, Praseodymium oxide**
RL: CAT (Catalyst use); USES (Uses)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen-storage** component; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(**alumina** stabilizer; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT **1344-28-1, Aluminum oxide**, uses **12036-32-7, Praseodymium oxide**
RL: CAT (Catalyst use); USES (Uses)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

L64 ANSWER 2 OF 26 HCA COPYRIGHT 2003 ACS on STN
136:204539 **Oxygen storage** material based on **cerium oxide**, process for its **production** and its use in treating exhaust gases of internal combustion engines. Mussmann, Lothar; Lindner, Dieter; Votsmeier, Martin; Lox, Egbert; Kreuzer, Thomas (OMG A.-G. & Co. K.-G., Germany). Eur. Pat. Appl. EP 1180397 A1 20020220, 16 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (German). CODEN: EPXXDW. APPLICATION: EP 2000-117898 20000819.

AB The invention relates to an **oxygen storing** material based on **cerium oxide** with one further oxide of the metals silicon and zirconium, whereby **cerium oxide** and further oxides are obtained in **form** of mixed oxides. The material is available through known hydroxidic preliminary stages that **produce** the mixed oxide in a wet-chem. way. Drying of the preliminary stage occurs at temps. between 80 and 300 .degree.C. Subsequently dried preliminary stages are treated in a hydrogen contg. atm. at a temp. between 600-900 .degree.C for the duration of 1-10 h. The reductive temp. treatment gives the material a substantially improved dynamic behavior compared to the customary calcination with air.

IC ICM B01J023-10
ICS C01F017-00; B01D053-94; B01J035-10

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST **oxygen storage catalyst ceria** exhaust gas; **ceria silica zirconia oxygen storage catalyst**

IT Exhaust gases (engine)
(**oxygen storage** material based on **cerium oxide**, process for its **prodn.** and its use in treating exhaust gases of internal combustion engines)

IT Hydrocarbons, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(**prodn.** of **oxygen storage** material based on **cerium oxide** and its use in treating exhaust gases of internal combustion engines)

IT Exhaust gas **catalytic** converters

(with **oxygen storage storage** material; **oxygen storage catalyst** based on **cerium oxide**, process for its **prodn.** and its use in treating exhaust gases of internal combustion engines)

IT 1333-74-0, Hydrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(calcining taken place in hydrogen atm. in **prodn.** of **oxygen storage** material based on **cerium oxide**)

IT 1304-28-5, Barium oxide, uses 1312-81-8, **Lanthanum oxide** 1313-97-9, Neodymium oxide **1314-23-4, Zirconia**, uses **1314-36-9, Yttrium oxide**, uses **1344-28-1, Alumina**, uses 7440-05-3, Palladium, uses 7440-16-6, Rhodium, uses **7631-86-9, Silica**, uses 11129-18-3, **Cerium oxide** **12036-32-7, Praseodymium oxide** **12036-41-8, Terbium oxide** 12060-08-1, Scandium oxide 12060-58-1, Samarium oxide 12064-62-9, Gadolinium oxide
RL: CAT (Catalyst use); USES (Uses)
(**prodn.** of **oxygen storage** material based on **cerium oxide** and its use in treating exhaust gases of internal combustion engines)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(**prodn.** of **oxygen storage** material based on **cerium oxide** and its use in treating exhaust gases of internal combustion engines)

IT **1314-23-4, Zirconia**, uses **1314-36-9, Yttrium oxide**, uses **1344-28-1, Alumina**, uses **7631-86-9, Silica**, uses **12036-32-7, Praseodymium oxide** **12036-41-8, Terbium oxide**
RL: CAT (Catalyst use); USES (Uses)
(**prodn.** of **oxygen storage** material based on **cerium oxide** and its use in treating exhaust gases of internal combustion engines)

L64 ANSWER 3 OF 26 HCA COPYRIGHT 2003 ACS on STN
135:293139 Coating of monolithic honeycomb-type structures with **catalytically** active components for **preparation** of three-way exhaust gas **catalysts**. Dettling, Joseph C.; Rosynsky, Victor; Wan, Chung-Zong (Engelhard Corporation, USA). U.S. Pat. Appl. Publ. US 20010026838 A1 20011004, 25 pp., Cont.-in-part of U.S. 5,953,832. (English). CODEN: USXXCO. APPLICATION: US 2001-873979 20010601. PRIORITY: US 1996-668385 19960621; US 1997-962363 19971031; US 1998-67831 19980428.

AB Monolithic **catalyst** structures with a no. of parallel channels (e.g., honeycomb monoliths) are **prepd.** in which the channels have different zones along their lengths that are characterized by different coatings (or no coatings) that extend to a certain length at certain portions of the monoliths. Sol. components in the coating compns. can be fixed along their resp. zones by forcing fluid into the parallel channels (i.e., by application of vacuum at the opposite end where the coating precursors are introduced). Control of the degree of vacuum and time necessary for uptake of the coating precursors will det. the length of the coating along the channels. The coating precursors can then undergo conventional heat treatment and calcination to finish the monolith **prepn.** Suitable components to be coated along the channels

include metal oxides (including rare earth oxides, transition metal oxides, alk. earth oxides, refractory metal oxides, and mol. sieves), precious metals (as **catalytic** components), and, optionally, **oxygen storage** components. The monolithic structures are used as three-way **catalysts** in exhaust gas **catalytic** converters.

IC ICM B05D007-22
NCL 427230000
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 42, 67
ST honeycomb monolith **catalyst prepn** exhaust gas; three way **catalyst** honeycomb monolith; coating honeycomb monolith **catalyst prepn**
IT Alkaline earth oxides
Oxides (inorganic), processes
Precious metals
Rare earth oxides
Transition metal oxides
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**catalysts** contg.; coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)
IT Coating materials
Coating process
Oxidation **catalysts**
(coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)
IT **Catalyst** supports
(honeycomb; coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)
IT **Catalysts**
(three-way, in exhaust gas converters; coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)
IT **1314-23-4, Zirconium dioxide**, processes
1344-28-1, Alumina, processes **7631-86-9, Silica**, processes **13463-67-7, Titanium dioxide**, processes
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**catalyst** supports; coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)
IT **1306-38-3, Cerium oxide**, processes
7439-88-5, Iridium, processes 7440-05-3, Palladium, processes
7440-06-4, Platinum, processes 7440-16-6, Rhodium, processes
7440-18-8, Ruthenium, processes **12036-32-7, Praseodymium oxide**
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**catalysts** contg.; coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)
IT **1314-23-4, Zirconium dioxide**, processes
1344-28-1, Alumina, processes **7631-86-9, Silica**, processes **13463-67-7, Titanium**

dioxide, processes
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**catalyst** supports; coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)

IT **1306-38-3, Cerium oxide**, processes
12036-32-7, Praseodymium oxide
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**catalysts** contg.; coating of monolithic honeycomb-type structures with **catalytically** active components for **prepn.** of three-way exhaust gas **catalysts**)

L64 ANSWER 4 OF 26 HCA COPYRIGHT 2003 ACS on STN
135:94626 Properties of **CeO2-ZrO2** solid solution and monolithic **catalyst** for methane combustion. Tang, Xiaolan; Tian, Jiuying; Chen, Yaoqiang; Yuan, Shuhua; Gong, Maochu (Institute of Catalytic Material,College of Chemistry, Sichuan University, Chengdu, 610064, Peop. Rep. China). Xinshiji De Cuihau Kexue Yu Jishu, Quanguo Cuihuaxue Jihuiyi Lunwenji, 10th, Zhangjiajie, China, Oct. 15-19, 2000, 67-68. Editor(s): Zhong, Bing. Shanxi Kexue Jishu Chubanshe: Taiyuan, Peop. Rep. China. (Chinese) **2000**. CODEN: 69ASHU.

AB **CeO2-ZrO2** solid solns. and **CeO2-ZrO2** solid solns. with rare earth oxide additives were **prepd.** by copptn. method. H2-TPR and XRD showed that addn. of rare earth oxide improved the **oxygen storage** capacity and thermal stability of the solid solns. The **oxygen storage** capacity and thermal stability of the solid solns. with high **CeO2** content were superior to those of the solid solns. with high **ZrO2** content. Monolithic **catalysts** for methane combustion were **prepd.** by impregnation method by using cordierite as the first carrier, .gamma.- **Al2O3**, **CeO2-ZrO2**, or **Y2O3-ZrO2** solid soln. as the second carrier, and Co, Cr, Mn, Fe, and/or Ni as active component. The **catalyst** with active components of Co, Mn, and Fe (or Cr) had high activity. The activity of the **catalyst** increased with the increasing of content of **oxygen storage** carrier.

CC 49-3 (Industrial Inorganic Chemicals)
Section cross-reference(s): 51

ST **ceria zirconia** solid soln methane combustion **catalyst**

IT Solid solutions
(**cerium oxide-zirconium oxide**; **prepn.** of **cerium oxide-zirconium oxide** solid soln. with rare earth oxide additives by copptn. method. for methane combustion)

IT Coprecipitation
(**prepn.** of **cerium oxide-zirconium oxide** solid soln. with rare earth oxide additives by copptn. method. for methane combustion)

IT Rare earth oxides
RL: MOA (Modifier or additive use); USES (Uses)
(**prepn.** of **cerium oxide-zirconium oxide** solid soln. with rare earth oxide additives by copptn. method. for methane combustion)

IT Combustion **catalysts**
(properties of **cerium oxide-zirconium oxide** solid soln. and monolithic **catalyst** for methane combustion)

IT 7439-89-6P, Iron, **preparation** 7439-96-5P, Manganese, **preparation** 7440-47-3P, Chromium, **preparation** 7440-48-4P, Cobalt, **preparation**
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
(**catalyst** contg.; properties of monolithic **catalyst** for methane combustion)

IT **1306-38-3P, Cerium oxide (CeO2), preparation 1314-23-4P, Zirconium oxide, preparation**
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
(properties of **cerium oxide-zirconium oxide** solid soln. and monolithic **catalyst** for methane combustion)

IT 74-82-8, Methane, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(properties of **cerium oxide-zirconium oxide** solid soln. and monolithic **catalyst** for methane combustion)

IT **1306-38-3P, Cerium oxide (CeO2), preparation 1314-23-4P, Zirconium oxide, preparation**
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
(properties of **cerium oxide-zirconium oxide** solid soln. and monolithic **catalyst** for methane combustion)

L64 ANSWER 5 OF 26 HCA COPYRIGHT 2003 ACS on STN
135:81245 Zeolite/**alumina catalyst** support compositions and method of **making** the same. Faber, Margaret K.; Wu, Shy-hsien; Xie, Yuming; Zaun, Kenneth E. (Corning Incorporated, USA). PCT Int. Appl. WO 2001047634 A1 20010705, 26 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US30357 20001103. PRIORITY: US 1999-PV173365 19991228.

AB Zeolite/**alumina** composite, and a method for **making**, the composite for use as a **catalyst** substrate or **catalyst** carrier and comprising zeolite having a **silica/alumina** ratio of greater than 300 and gamma **alumina** having a sp. surface area of greater than 100 m2/g. The zeolite/**alumina** composite exhibits a modulus of rupture of at least 750 psi. Addnl., the invention is also directed at a three **catalyst** (TWC) system for use in the removal of hydrocarbons, carbon monoxide and oxides of nitrogen from waste gas, the TWC system comprising the following components: (1) a zeolite/**alumina** composite **catalyst** support exhibiting a modulus of rupture of at least 750 psi and having a zeolite with a **silica**/zeolite ratio of at least 300 and the **alumina** comprising a gamma **alumina** having a sp. surface area of greater than 100 m2/g; and, (2) a noble metal **catalyst** impregnated on the **catalyst** support, the noble metal selected from the group consisting of platinum, rhodium, iridium and palladium.

IC ICM B01J029-06
ICS B01J035-04; B01J037-00; B01D053-94

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
ST zeolite **alumina** three way **catalyst** support; exhaust gas zeolite **alumina catalyst** support
IT Noble metals
Zeolite ZSM-5
Zeolites (synthetic), uses
RL: CAT (Catalyst use); USES (Uses)
(compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT Hydrocarbons, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT **Catalyst** supports
(honeycomb; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT **Catalysts**
(three-way; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT 1318-23-6, Boehmite 7439-88-5, Iridium, uses 7439-91-0, Lanthanum, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**oxygen storage** material; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT 9004-57-3, Ethylcellulose 9004-62-0, Hydroxyethylcellulose 9004-64-2, Hydroxypropylcellulose 9004-65-3, Hydroxypropylmethylcellulose 9004-67-5, Methylcellulose 9032-42-2, Hydroxyethylmethylcellulose 9041-56-9, Hydroxybutylmethylcellulose 37208-08-5, Hydroxybutylcellulose 37353-59-6, Hydroxymethylcellulose
RL: CAT (Catalyst use); USES (Uses)
(temporary binder for honeycomb monolith; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)
IT 1304-28-5, Barium oxide, uses 1305-78-8, Calcium oxide, uses **1306-38-3, Ceria**, uses 1309-48-4, Magnesia, uses **1314-36-9, Yttrium oxide**, uses **12036-32-7, Praseodymium oxide** **13463-67-7**, Titania, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**zirconia** dopant; compn. and **manuf**. of zeolite/

alumina catalyst supports for exhaust gas three way **catalysts**)

IT **1344-28-1**, .gamma.-**Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(.gamma.-, .gamma.-; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)

IT **1314-23-4**, **Zirconia**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**oxygen storage** material; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)

IT **1306-38-3**, **Ceria**, uses **1314-36-9**, **Yttrium oxide**, uses **12036-32-7**, **Praseodymium oxide 13463-67-7**, Titania, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**zirconia** dopant; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)

IT **1344-28-1**, .gamma.-**Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(.gamma.-, .gamma.-; compn. and **manuf**. of zeolite/**alumina catalyst** supports for exhaust gas three way **catalysts**)

L64 ANSWER 6 OF 26 HCA COPYRIGHT 2003 ACS on STN
135:50296 **Catalyst** composition containing **oxygen storage** components. Wu, Joseph H. Z.; Syed, Mukaram K. (Engelhard Corporation, USA). U.S. US 6248688 B1 20010619, 12 pp., Cont.-in-part of U.S. 5,898,014. (English). CODEN: USXXAM. APPLICATION: US 1999-238181 19990128. PRIORITY: US 1996-722761 19960927.

AB The present invention relates to a zirconium, rare earth contg. compn. comprising zirconium, cerium, neodymium and praseodymium components and the use of this compn. in a **catalyst** compn. useful for the treatment of gases to reduce contaminants contained therein and method process to **make** the **catalyst** compn. The **catalyst** has the capability of substantially simultaneously **catalyzing** the oxidn. of hydrocarbons and carbon monoxide and the redn. of nitrogen oxides.

IC ICM B01J023-10
ICS B01J023-54

NCL 502302000

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST three way **catalyst oxygen storage** **zirconia ceria** neodymia praseodymia

IT **Catalysts**
(**oxygen storage**; three-way **catalyst** compn. contg. **oxygen storage** components)

IT Aluminosilicates, uses
RL: CAT (Catalyst use); USES (Uses)
(support material for three-way **catalyst** compn. contg. **oxygen storage** components)

IT Exhaust gases (engine)
(three-way **catalyst** compn. contg. **oxygen storage** components)

IT Hydrocarbons, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(three-way **catalyst** compn. contg. **oxygen**

storage components)
IT **Catalysts**
(three-way; three-way **catalyst** compn. contg. **oxygen storage** components)
IT 1304-28-5, Barium oxide, uses 1305-78-8, Calcium oxide, uses 1309-48-4, Magnesium oxide, uses 1314-11-0, Strontium oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(alk. earth metal component of three-way **catalyst** compn. contg. **oxygen storage** components)
IT 7440-05-3, Palladium, uses
RL: CAT (Catalyst use); USES (Uses)
(precious metal component of three-way **catalyst** compn. contg. **oxygen storage** components)
IT 1312-81-8, Lanthana
RL: CAT (Catalyst use); USES (Uses)
(rare earth metal component of three-way **catalyst** compn. contg. **oxygen storage** components)
IT 1308-38-9, Chromia, uses **1344-28-1**, **Alumina**, uses **7631-86-9**, **Silica**, uses **13463-67-7**, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(support material for three-way **catalyst** compn. contg. **oxygen storage** components)
IT **1306-38-3**, **Ceria**, uses 1313-97-9, Neodymium oxide **1314-23-4D**, **Zirconia**, cat **1344-28-1D**, **Alumina**, **zirconia**-activated 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 12037-29-5, **Praseodymium oxide** (Pr6O11)
RL: CAT (Catalyst use); USES (Uses)
(three-way **catalyst** compn. contg. **oxygen storage** components)
IT 7782-44-7, Oxygen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(three-way **catalyst** compn. contg. **oxygen storage** components)
IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(three-way **catalyst** compn. contg. **oxygen storage** components)
IT **1344-28-1**, **Alumina**, uses **7631-86-9**, **Silica**, uses **13463-67-7**, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(support material for three-way **catalyst** compn. contg. **oxygen storage** components)
IT **1306-38-3**, **Ceria**, uses **1314-23-4D**, **Zirconia**, cat **1344-28-1D**, **Alumina**, **zirconia**-activated
RL: CAT (Catalyst use); USES (Uses)
(three-way **catalyst** compn. contg. **oxygen storage** components)

L64 ANSWER 7 OF 26 HCA COPYRIGHT 2003 ACS on STN
134:314693 **CeO2-ZrO2** solid solutions **prepared** by modified sol-gel method and their characteristics. Yang, Zhibo; Lin, Peiyan; Xiao, Li; Yu, Shouming (Department of Chemical Physics, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China). Gongneng Cailiao, 31(6), 657-659 (Chinese) **2000**. CODEN: GOCAEA. ISSN: 1001-9731. Publisher: Gongneng Cailiao Bianjibu.

AB The Ce0.65Zr0.35O2, Ce0.65Zr0.25Y0.10O2 and Ce0.65Zr0.32La0.03O2 solid solns. were **prepd.** by modified sol-gel route with ZrO(NO3)2.6H2O, Ce(NO3)3.H2O, La(NO3)3.6H2O, Y(NO3)3.5H2O and citric acid; and by ultra-fine **CeO2** impregnated with nitrates soln. method resp.; and the phases and crystal structure of solid solns. were studied by XRD and LRS after calcination at different temps., and the process of the precursor's transformation to **form** the solid soln. was traced by DTA. The results showed that the solid solns. **synthesized** by modified sol-gel method had larger sp. surface area, higher **oxygen storage** capacity and purer fluorite cubic phase than that of solid solns. **synthesized** by another method. The high dispersed solid solns. **formed** by mixing homogeneous sol-gel precursors with .gamma.-**Al2O3** had high thermal stability. The solid soln. could be used as a three-way **catalyst** support.

CC 57-2 (Ceramics)

ST **ceria zirconia** solid soln **prepn**

IT Crystal structure
Microstructure
Oxidation **catalysts**
Phase composition
Sol-gel processing
Solid solutions
Surface area
Thermal stability
(**CeO2-ZrO2** solid solns. **prepd.** by modified sol-gel method and their characteristics)

IT 154041-86-8P, Cerium **zirconium oxide** (Ce0.65Zr0.35O2)
334970-41-1P, Cerium yttrium **zirconium oxide** (Ce0.65Y0.1Zr0.25O2) 334970-42-2P, Cerium lanthanum **zirconium oxide** (Ce0.65La0.03Zr0.32O2)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(**CeO2-ZrO2** solid solns. **prepd.** by modified sol-gel method and their characteristics)

IT **1306-38-3, Ceria**, reactions 10099-59-9, Lanthanum nitrate 10361-93-0, Yttrium nitrate 13093-17-9, Cerium nitrate 13746-89-9, Zirconium nitrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(**CeO2-ZrO2** solid solns. **prepd.** by modified sol-gel method and their characteristics)

IT **1306-38-3, Ceria**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**CeO2-ZrO2** solid solns. **prepd.** by modified sol-gel method and their characteristics)

L64 ANSWER 8 OF 26 HCA COPYRIGHT 2003 ACS on STN
133:285675 Layered noble metal-containing exhaust gas **catalyst** and its **preparation.** Mussmann, Lothar; Lindner, Dieter; Harris, Michael; Kreuzer, Thomas; Lox, Egbert (Degussa-Huels Aktiengesellschaft, Germany). Eur. Pat. Appl. EP 1046423 A2 **20001025**, 17 pp.
DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW.
APPLICATION: EP 1999-119600 19991002. PRIORITY: EP 1999-108061 19990423.

AB The invention relates to a high performance **catalyst** contg. an inner and an outer layer on an inert carrier body comprising noble metals from the platinum group deposited on support materials. The **catalyst** is characterized in that, the inner layer comprises platinum deposited on a first support and on a first **oxygen storage** component and the outer layer comprises platinum and rhodium deposited on a second support only and the second layer further

comprises a second **oxygen storage** component.
IC ICM B01J023-63
ICS B01J035-00; B01D053-94
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
ST exhaust gas **catalyst** platinum rhodium double layer; nitrogen oxide exhaust gas **catalyst**; nickel manganese hydrogen sulfide control exhaust gas **catalyst**
IT Exhaust gases (engine)
(doubled-layered platinum-rhodium three-way exhaust gas **catalyst** and its **prepn.**)
IT Hydrocarbons, processes
RL: REM (Removal or disposal); PROC (Process)
(doubled-layered platinum-rhodium three-way exhaust gas **catalyst** and its **prepn.**)
IT **Catalysts**
(three-way; doubled-layered platinum-rhodium three-way exhaust gas **catalyst** and its **prepn.**)
IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: REM (Removal or disposal); PROC (Process)
(doubled-layered platinum-rhodium three-way exhaust gas **catalyst** and its **prepn.**)
IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses 7440-06-4, Platinum, uses 12037-29-5, **Praseodymium oxide** pr6o11
RL: CAT (Catalyst use); USES (Uses)
(inner and outer layer component of doubled-layered platinum-rhodium three-way exhaust gas **catalyst**)
IT 1313-13-9, Manganese oxide, uses 1313-99-1, Nickel oxide nio, uses
RL: CAT (Catalyst use); USES (Uses)
(inner layer component for H2S control in doubled-layered platinum-rhodium three-way exhaust gas **catalyst**)
IT 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(outer layer component of doubled-layered platinum-rhodium three-way exhaust gas **catalyst**)
IT **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(stabilized with **La2O3**; inner and outer layer component of doubled-layered platinum-rhodium three-way exhaust gas **catalyst**)
IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(inner and outer layer component of doubled-layered platinum-rhodium three-way exhaust gas **catalyst**)
IT **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(stabilized with **La2O3**; inner and outer layer component of doubled-layered platinum-rhodium three-way exhaust gas **catalyst**)

L64 ANSWER 9 OF 26 HCA COPYRIGHT 2003 ACS on STN
133:139510 **Catalyst** composition containing **oxygen storage** components. Wu, Joseph H. Z.; Syed, Mukaram K. (Engelhard Corporation, USA). PCT Int. Appl. WO 2000044493 A1 **20000803**, 37 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN,

MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US1219 20000119. PRIORITY: US 1999-238181 19990128.

AB The present invention relates to a zirconium, rare earth contg. compn. comprising zirconium, cerium, neodymium and praseodymium components and the use of this compn. in a **catalyst** compn. useful for the treatment of gases to reduce contaminants contained therein and a process to **make** the **catalyst** compn. The **catalyst** has the capability of substantially simultaneously **catalyzing** the oxidn. of hydrocarbons and carbon monoxide and the redn. of nitrogen oxides.

IC ICM B01J023-10
ICS B01D053-86; B01J023-63; C01G025-00; C01F017-00

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST exhaust gas **catalyst oxygen storage** component

IT Exhaust gases (engine)
(**catalyst** compn. contg. **oxygen storage** components)

IT Aluminosilicates, uses
Rare earth metals, uses
Rare earth oxides
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** compn. contg. **oxygen storage** components)

IT Hydrocarbons, processes
RL: REM (Removal or disposal); PROC (Process)
(**catalyst** compn. contg. **oxygen storage** components)

IT 1304-28-5, Barium oxide, uses **1306-38-3**, **Ceria**, uses 1308-38-9, Chromia, uses 1313-97-9, Neodymia 1314-11-0, Strontium oxide, uses **1314-23-4**, **Zirconia**, uses **1344-28-1**, **Alumina**, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-95-4, Magnesium, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-10-0, Praseodymium, uses 7440-16-6, Rhodium, uses 7440-24-6, Strontium, uses 7440-39-3, Barium, uses 7440-45-1, Cerium, uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses **7631-86-9**, **Silica**, uses 7782-44-7, Oxygen, uses **12036-32-7**, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** compn. contg. **oxygen storage** components)

IT 1310-73-2, Sodium hydroxide, reactions 7664-41-7, Ammonia, reactions 7697-37-2, Nitric acid, reactions 7722-84-1, Hydrogen Peroxide, reactions 10045-95-1, Neodymium nitrate 10102-05-3, Palladium nitrate 10139-58-9, Rhodium nitrate 10361-80-5, Praseodymium nitrate 13746-89-9, Zirconium nitrate 14475-63-9, Zirconium hydroxide 14644-61-2, Zirconium sulfate 17309-53-4, Cerium nitrate 18480-07-4, Strontium hydroxide
RL: RCT (Reactant); RACT (Reactant or reagent)
(**catalyst** compn. contg. **oxygen storage** components)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: REM (Removal or disposal); PROC (Process)

(**catalyst** compn. contg. **oxygen storage** components)

IT 64-19-7, Acetic acid, uses 7732-18-5, Water, uses 29063-28-3, Octanol
RL: TEM (Technical or engineered material use); USES (Uses)
(solvent; **catalyst** compn. contg. **oxygen storage** components)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses **7631-86-9, Silica**, uses **12036-32-7**, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** compn. contg. **oxygen storage** components)

L64 ANSWER 10 OF 26 HCA COPYRIGHT 2003 ACS on STN
132:351857 Microstructure and oxygen release properties of **catalytic alumina**-supported **CeO2-ZrO2 powders**.
Ozawa, M.; Matuda, K.; Suzuki, S. (CRL, Nagoya Institute of Technology, Tajimi, Gifu, Japan). Journal of Alloys and Compounds, 303-304, 56-59 (English) **2000**. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science S.A..

AB This paper describes the phase anal. and oxygen release characteristics of **catalytic** mixed oxides in the system of **CeO2-ZrO2/Al2O3** heated at 800.degree.. The potential **oxygen storage** capacity is improved by the addn. of **ZrO2** to **CeO2** in the case of **alumina**-supported oxides that are easy to **prep.** by wet impregnation process.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST **alumina** supported **ceria zirconia** microstructure oxygen release

IT **Catalysts**
(three-way; microstructure and oxygen release properties of **alumina**-supported **CeO2-ZrO2**)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(microstructure and oxygen release properties of **alumina** -supported **CeO2-ZrO2**)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(microstructure and oxygen release properties of **alumina** -supported **CeO2-ZrO2**)

L64 ANSWER 11 OF 26 HCA COPYRIGHT 2003 ACS on STN
132:39723 **Catalyst** for purifying exhaust gas and process for **producing** the same. Takada, Toshihiro (Toyota Jidosha Kabushiki Kaisha, Japan; Toyota Motor Co., Ltd.). Eur. Pat. Appl. EP 963781 A2 **19991215**, 16 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-110057 19990521. PRIORITY: JP 1998-154677 19980603.

AB A **catalyst** for purifying an exhaust gas includes a porous oxide support, an **O2 storage**-and-release material, and a noble metal. The support and the **oxygen storage** -and-release material are **formed** into a composite oxide support. The noble metal is loaded on the composite oxide support. In the **catalyst**, the **fine particles** of the **oxygen storage**-and-release material are trapped in the

fine compartments of the support, and are prevented from moving when subjected to a high temp. The support exhibits a sp. surface area which decreases less after a high-temp. durability test. The **oxygen storage**-and-release material and the noble metal are kept from growing **granularly** at elevated temps. The **catalyst** maintains the high performance even in high temp.

IC ICM B01D053-94
ICS B01J037-03; B01J023-63; B01J023-89

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST exhaust gas **catalyst oxygen storage**

IT Exhaust gases (engine)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT Aluminosilicates, uses
Beta zeolites
Ferrierite-type zeolites
Mordenite-type zeolites
Noble metals
Platinum-group metals
Ultrastable Y zeolites
Zeolite ZSM-5
Zeolites (synthetic), uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT **Catalysts**
(**oxygen-storage**; **oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT Hydrocarbons, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(unburnt; **oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT **1306-38-3, Ceria**, uses 1309-48-4, Magnesia, uses **1314-23-4, Zirconia**, uses 1332-37-2, Iron oxide, uses **1344-28-1, Alumina**, uses 7439-88-5, Iridium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-22-4, Silver, uses 7440-74-6, Indium, uses **7631-86-9, Silica**, uses 12789-64-9, Iron **titanium oxide 13463-67-7, Titania**, uses 65453-23-8, Cerium **zirconium oxide**
RL: CAT (Catalyst use); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT 78-10-4, Silicon tetraethoxide 4073-85-2, Aluminum tripropoxide 5593-70-4, Titanium tetrabutoxide 7429-90-5D, Aluminum, alkoxides, uses 7440-21-3D, Silicon, alkoxides, uses 7440-32-6D, Titanium, alkoxides, uses 7440-67-7D, Zirconium, alkoxides, uses 7782-61-8, Iron trinitrate nonahydrate 10294-41-4, Cerium trinitrate hexahydrate 13746-89-9, Zirconium nitrate 13825-74-6, Titanium oxysulfate 14104-77-9, Iron nitrate 17309-53-4, Cerium nitrate 20213-65-4, Zirconyl nitrate dihydrate 22465-17-4, Titanium nitrate
RL: NUU (Other use, unclassified); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT 7782-44-7, Oxygen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses **7631-86-9, Silica**, uses **13463-67-7, Titania**, uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

L64 ANSWER 12 OF 26 HCA COPYRIGHT 2003 ACS on STN
131:355243 Low emission three-way **catalyst** and OSC material development for OBD diagnostics. Maunula, T.; Vakkilainen, A.; Lievonen, A.; Torkkell, K.; Niskanen, K.; Harkonen, M. (Catalyst Research, Kemira Metalkat, Finland). Society of Automotive Engineers, [Special Publication] SP, SP-1478(Advanced Emissions and Controls), 55-67 (English) **1999**. CODEN: SAESA2. ISSN: 0099-5908. Publisher: Society of Automotive Engineers.

AB The development of efficient, durable three-way **catalysts** with on-board diagnosis (OBD) facilities needs cooperation between different areas related to engine, control and **catalyst** technologies. High-loading Pd and Pd-Rh precatalysts with .lambda. sensors upstream and downstream were evaluated in FTP cycle to find out the appropriate driving conditions for OBD-II. Diagnostic values were calcd. by the damping of .lambda. responses caused by the aged precatalyst. The ratio of **oxygen storage** capacity (OSC) and precious metals were studied to improve the correlation between calcd. diagnostic values and the **catalyst** efficiency. In fact, the correlation from diagnostic values was better to NOx than to total hydrocarbon (THC) efficiency by bag 1 and 2 emissions in FTP 75. The amplitude method with two .lambda. sensors over warm converters is commonly used for OBD but hydrocarbon emissions are mainly **formed** during cold-start periods. Therefore the OBD calibration and **catalyst** optimal compns. have conflicting demands. The **catalyst** compn. and ageing method were varied to investigate the meaning of precious metals and OSC in developing a single close-coupled converter for small size vehicles with EOBD facilities. The diagnostic values and conditions were analyzed over each cruise phase with these samples. At the beginning of some short cruise phases, the postsensor was few seconds behind the presensor indicating wide excursions from lean to rich/stoichiometric and oxygen consumption from the surface. The co-operation of dispersed or Zr stabilized ceria with Pd and Rh was weaker than with Pt. Dynamic OSC measured in transient closed-loop conditions with engine or lab. reactor is the right unit to show the practical ability of the **catalyst** to **store** and release **oxygen** in driving conditions. In the future a more precise Engine Management System (EMS) calibrated to engine, **catalyst** properties, OBD algorithms and several .lambda./temp./ concn. sensors will cut emissions in warm and hot exhaust gases during steady and transient driving conditions. The **catalyst** warm-up and light-off (focused on hydrocarbons) is after these trimmings the main development target.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST three way **catalyst oxygen storage** capacity on board diagnosis; exhaust gas emission redn on board diagnosis

IT Exhaust gases (engine)

(low emission three-way **catalyst** and **oxygen storage** capacity material development for on-board diagnosis)

IT **Catalysts**
(three-way; low emission three-way **catalyst** and **oxygen storage** capacity material development for on-board diagnosis)

IT 12003-65-5, Aluminum **lanthanum oxide** (AlLaO3)
12031-48-0, Lanthanum **zirconium oxide** (La2Zr2O7)
113288-33-8, Cerium **zirconium oxide** (Ce0.16Zr0.84O2)
250276-76-7, Aluminum **lanthanum oxide** (Al1.2La0.1O2)
250277-31-7, Aluminum **lanthanum oxide** (Al1.1La0.2O1.8)
RL: CAT (Catalyst use); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(detected compds. on aged **catalysts** in low emission three-way **catalyst** and **oxygen storage** capacity material development for on-board diagnosis)

IT **1306-38-3, Ceria**, uses 1312-81-8, Lanthana
1314-23-4, Zirconia, uses **1344-28-1, Alumina**, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(low emission three-way **catalyst** and **oxygen storage** capacity material development for on-board diagnosis)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(low emission three-way **catalyst** and **oxygen storage** capacity material development for on-board diagnosis)

L64 ANSWER 13 OF 26 HCA COPYRIGHT 2003 ACS on STN
131:313671 **Manufacture** of monolithic **catalysts** suitable for exhaust gas treatment. Dettling, Joseph C.; Rosynsky, Victor; Wan, Chung-Zong (Engelhard Corporation, USA). PCT Int. Appl. WO 9955459 A1 **19991104**, 65 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US7433 19990401. PRIORITY: US 1998-67820 19980428.

AB A **catalyst** support, esp. a monolithic ceramic or metallic honeycomb, is provided with different **catalytic**/treatment zones along the length of its parallel channels, where the zones are defined by their coating (or lack of coating) and are extended along a length of the channel in which there is the same coating and architecture. Coating compns. contg. sol. components, e.g., platinum group metals, are fixed in specific zones. **Oxygen storage** components, e.g., Pr and Ce compds., are provided in outlet layers in the channels. The inlet and outlet layers contg. base oxides (e.g., alk. earth oxides, rare earth oxides, **ZrO2**, **La2O3**, Nd2O3) and precious metals are provided in the channels by passing a coating compn. into the inlet (or outlet), then applying a vacuum to the outlet while forcing a heated gas (air) at 75-400.degree.C through the channels to dry the inlet layers and fix the precious metal component. The completed **catalyst** is heated at 200-400.degree.C for 1-10 s and calcined at 250-900.degree.C for 0.1-10 h.

IC ICM B01J037-02

ICS B05D007-22; B28B011-04; C04B041-45; C04B041-87
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67
ST **catalyst** monolithic exhaust gas treatment; three way monolithic **catalyst** exhaust gas
IT Alkaline earth oxides
Platinum-group metals
Rare earth oxides
Transition metal oxides
Zeolites (synthetic), uses
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**; monolithic **catalysts** for exhaust gas treatment)
IT **Catalyst** supports
Exhaust gas **catalytic** converters
Honeycomb structures
(monolithic **catalysts** for exhaust gas treatment)
IT **Catalysts**
(three-way; monolithic **catalysts** for exhaust gas treatment)
IT Hydrocarbons, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(unburnt; monolithic **catalysts** for exhaust gas treatment)
IT 7439-88-5, Iridium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**; monolithic **catalysts** for exhaust gas treatment)
IT **1306-38-3**, **Cerium oxide**, uses 1312-81-8, Lanthana 1313-97-9, Neodymia **1314-23-4**, **Zirconia**, uses **1344-28-1**, **Aluminum oxide** (**Al2O3**), uses **7631-86-9**, **Silica**, uses **12036-32-7**, **Praseodymium oxide** **13463-67-7**, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(monolithic **catalysts** for exhaust gas treatment)
IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(monolithic **catalysts** for exhaust gas treatment)
IT **1306-38-3**, **Cerium oxide**, uses **1314-23-4**, **Zirconia**, uses **1344-28-1**, **Aluminum oxide** (**Al2O3**), uses **7631-86-9**, **Silica**, uses **12036-32-7**, **Praseodymium oxide** **13463-67-7**, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(monolithic **catalysts** for exhaust gas treatment)

L64 ANSWER 14 OF 26 HCA COPYRIGHT 2003 ACS on STN
130:356221 **Ceria** films on **zirconia** substrates models for understanding **oxygen-storage** properties. Putna, E. S.; Bunluesin, T.; Fan, X. L.; Gorte, R. J.; Vohs, J. M.; Lakis, R. E.; Egami, T. (Department of Chemical Engineering, University of Pennsylvania, Philadelphia, PA, 19104, USA). Catalysis Today, 50(2), 343-352 (English) **1999**. CODEN: CATTEA. ISSN: 0920-5861. Publisher: Elsevier Science B.V..
AB **O2-storage** properties of **CeO2** in three-way automotive **catalysts** are promoted and stabilized by mixing with **ZrO2**. This promotion was examd. using model **catalysts**

in which **CeO2** films were vapor-deposited onto .alpha.-**Al2O3**, polycryst. **ZrO2**, polycryst. **Y2O3**-stabilized **ZrO2** (YSZ), and YSZ(1 0 0), (1 1 1), and (1 1 0) single crystals. Following Pd deposition, temp.-programmed desorption of CO and steady-state CO oxidn. kinetics suggested the **CeO2** films on the **ZrO2**-based substrates were much more easily reduced than films on .alpha.-**Al2O3**. Polycryst. **ZrO2** and YSZ and the YSZ single crystals were equally effective in promoting **CeO2** reducibility. Structural studies of **CeO2** on YSZ(1 0 0), using transition electron microscopy and EDSXD (energy-dispersive, surface X-ray diffraction), demonstrated that **CeO2** forms ordered overlayers on YSZ(1 0 0), oriented with respect to the YSZ surface. The lattice parameter for **CeO2** was decreased by only 0.6% vs. bulk **CeO2**, but the coherence length suggested the overlayer may have a high defect d. It is suggested that the structure-directing properties of **ZrO2** are responsible for the enhanced properties of **CeO2**-**ZrO2** mixed oxides.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST **ceria** film **zirconia** substrate three way **catalyst**; **oxygen storage** property **ceria zirconia catalyst**; exhaust gas three way **catalyst oxygen storage**; polycryst yttria stabilized **zirconia** three way **catalyst**

IT Exhaust gases (engine)
Thermal stability
(studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT **Catalysts**
(three-way; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT 7782-44-7, **Oxygen**, processes
RL: OCU (Occurrence, unclassified); PEP (Physical, engineering or chemical process); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(**catalytic storage** of; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT **1314-23-4**, **Zirconia**, uses **1344-28-1**, **Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(**ceria** films supported by; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT 7440-05-3, Palladium, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(deposition on **ceria-zirconia catalyst**; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT **1314-36-9**, Yttria, uses
RL: CAT (Catalyst use); USES (Uses)
(pure and **zirconia** stabilized with polycryst.; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT 630-08-0, Carbon monoxide, processes

RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT **1306-38-3, Ceria,** uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**zirconia** supported; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT **1314-23-4, Zirconia,** uses **1344-28-1, Alumina,** uses
RL: CAT (Catalyst use); USES (Uses)
(**ceria** films supported by; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT **1314-36-9,** Yttria, uses
RL: CAT (Catalyst use); USES (Uses)
(pure and **zirconia** stabilized with polycryst.; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

IT **1306-38-3, Ceria,** uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**zirconia** supported; studying **oxygen storage** properties using model **ceria** film-stabilized **zirconia** substrates in automotive three-way **catalysts**)

L64 ANSWER 15 OF 26 HCA COPYRIGHT 2003 ACS on STN
130:356219 Characterization of model automotive exhaust **catalysts** Pd on **ceria** and **ceria-zirconia** supports. Jen, H.-W.; Graham, G. W.; Chun, W.; McCabe, R. W.; Cuif, J.-P.; Deutsch, S. E.; Touret, O. (Ford Research Laboratory, Dearborn, MI, USA). Catalysis Today, 50(2), 309-328 (English) **1999**. CODEN: CATTEA. ISSN: 0920-5861. Publisher: Elsevier Science B.V..

AB Pure **CeO2**, **SiO2**-doped **CeO2**, **CeO2-ZrO2** solid solns., and CeO2ZrO2 solid solns. with partial incorporation of Pr in the structure were **prepd.** by Rhodia as high-surface area **powders** and used as supports in model Pd automotive three-way **catalysts prepd.** at Ford. The **catalysts** were aged for 12 h at 1050.degree., in air and under redox conditions simulating automotive exhaust gases. Both fresh and aged **catalysts** were characterized by a combination of techniques including **O2 storage** capacity (OSC) measurements. After aging, **catalysts prepd.** on the solid soln. materials provided much greater OSC than those based on pure **CeO2** or **SiO2**-doped **CeO2**. Adding 5 wt. percent Pr7O11 as a substitute for **CeO2** improved the thermal stability of the **CeO2-ZrO2**, without increasing the OSC of the model **catalysts**. **CeO2-ZrO2** based **catalysts** revealed a new temp.-programmed redn. peak, between 100.degree. and 200.degree., after 1050.degree. aging, which is attributed to Pd-assisted bulk redn. of **CeO2**. Significant differences in OSC were noted between **catalysts prepd.** on a series of 70 wt. percent **CeO2**-30 wt. percent **ZrO2** supports **prepd.** by different processes, despite virtually identical characteristics of the aged materials as judged by the other techniques. These observations

indicated that different processing methods lead to different phys. and chem. characteristics of aged **catalysts**, not readily discerned by conventional characterization techniques, but nonetheless affecting performance.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST palladium based three way exhaust **catalyst**; **ceria** **zirconia** supported three way **catalyst**; phys characterization palladium based three way **catalyst**

IT Exhaust gases (engine)
Surface area
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT Hydrocarbons, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT Pore size distribution
(pore vol. and; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **Catalysts**
(three-way, palladium-based; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 7782-44-7, **Oxygen**, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); REM (Removal or disposal); PROC (Process); RACT (Reactant or reagent)
(**catalyst storage** capacity for; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 7440-05-3, Palladium, uses
RL: CAT (Catalyst use); USES (Uses)
(**ceria** and **ceria-zirconia** supported; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **7631-86-9**, **Silica**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**ceria** doped with; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **12036-32-7**, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 124-38-9, Carbon dioxide, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); POL (Pollutant); FORM (Formation, nonpreparative); OCCU (Occurrence); PROC (Process)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 630-08-0, Carbon monoxide, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)

(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by **ceria** and; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by pure, **silica**-stabilized, and **zirconia**; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 1333-74-0, Hydrogen, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(uptake; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **7631-86-9, Silica**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**ceria** doped with; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **12036-32-7**, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by **ceria** and; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by pure, **silica**-stabilized, and **zirconia**; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

L64 ANSWER 16 OF 26 HCA COPYRIGHT 2003 ACS on STN
129:293326 **Catalyst** composition containing oxides of cerium, zirconium and neodymium for exhaust gas purification. Wu, Joseph Hui-zhao; Wan, Chung-zong; Steger, John J. (Engelhard Corporation, USA). PCT Int. Appl. WO 9845027 A1 **19981015**, 27 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US6202 19980330. PRIORITY: US 1997-833701 19970408.

AB A **catalyst** for NOx redn. and oxidn. of at least CO contains an **oxygen storage** component that provides superior **oxygen storage** function. The **oxygen storage** component contains mixed oxides of cerium, neodymium and zirconium. Typically, **ceria** is at >30 wt.% of the **ceria**

plus **zirconia**, e.g., 32-44%. Preferably, the oxide also includes neodymia at .ltoreq.26 wt.% of the **ceria**, e.g., 18.6-23.5%. The mixed oxide may be co-formed and prepd. by, e.g., co-pptg. compds. of zirconium and the rare earth metals, then calcining the co-ppt.

IC ICM B01D053-94
ICS B01J023-10; B01J023-66

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST exhaust gas **catalyst oxygen storage** compn; three way **catalyst oxygen storage** compn

IT Exhaust gas **catalytic** converters
(**catalysts** for; exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT Platinum-group metals
RL: CAT (Catalyst use); USES (Uses)
(exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT **Catalysts**
(three-way; exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT Hydrocarbons, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(unburnt; exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT 1302-88-1, Cordierite **1306-38-3, Ceria**, uses
1313-97-9, Neodymia **1314-23-4, Zirconia**, uses
7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT 506-87-6, Ammonium carbonate 7440-06-4D, Platinum, amine hydroxides, uses 7697-37-2, Nitric acid, uses 10045-95-1, Neodymium nitrate 10108-73-3, Cerium nitrate 10139-58-9, Rhodium nitrate 13746-89-9, Zirconium nitrate
RL: NUU (Other use, unclassified); USES (Uses)
(exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(.gamma.-; exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

IT **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(.gamma.-; exhaust gas **catalyst** contg. oxides of cerium, zirconium and neodymium as **oxygen storage** compn.)

L64 ANSWER 17 OF 26 HCA COPYRIGHT 2003 ACS on STN
129:220317 Reactor evaluation of **ceria-zirconia** as an **oxygen storage** material for automotive **catalysts**
. Permana, H.; Belton, D. N.; Rahmoeller, K. M.; Schmieg, S. J.; Hori, C. E.; Ng, K. Y. S.; Brenner, A. (General Motors R and D, USA). Society of Automotive Engineers, [Special Publication] SP, SP-1288(Zirconium in Emission Control), 23-33 (English) **1997**. CODEN: SAESA2. ISSN: 0099-5908. Publisher: Society of Automotive Engineers.

AB We have **prepd**. and tested lab. scale monoliths wash-coated with 10, 20 and 30 wt.% either **CeO2** or Ce.75Zr.25O2 (remainder is **alumina**). Wet impregnation was used to load the wash-coated monoliths with 50 g/lb Pt:Rh at a 5:1 ratio. The **catalyst** were aged at temps. between 825.degree.C and 950.degree.C using a cycled redox aging. The **catalysts** were then tested in a full-feed simulated exhaust lab. reactor with air-to-fuel ratio (A/F) perturbations (frequencies at 1 and 3 Hz and amplitudes up to +/- 0.8 A/F). Even the lowest loading of Ce.75Zr.25O2 outperformed all three loadings of **CeO2** over a full range of reaction temps., A/F perturbations, and **catalyst** space velocity (SV). Our data indicates that the **ceria-zirconia catalysts** can tolerate cycled redox aging at sustained bed temps. at least 25.degree.C higher (.apprx.925.degree.C vs. <900.degree.C) than can **ceria**. For the **CeO2 catalysts** aged at or above 900.degree.C we obsd. an inverse correlation of **catalyst** activity to **CeO2** loading. Using activity measurements, we attributed this inverse correlation to excessive sintering of the precious metals (PM) in the highly **CeO2** loaded parts. For the Ce.75Zr.25O2 **catalysts** we found the performance to be insensitive to **catalysts** aging up to aging temp. of 925.degree.C (for 8 h). For the Ce.75Zr.25O2 **catalysts** we found the performance to be independent of Ce.75Zr.25O2 loading between 10 and 30 wt.%. Reactor measurements of OSC show that increasing the Ce.75Zr.25O2 loading was not increasing OSC in the aged parts even though the higher loaded fresh **catalysts** had higher OSC. Taken together our data suggest that poor PM distribution to the Ce.75Zr.25O2 resulted in an "under-promotion" of this **oxygen storage** materials.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST exhaust automotive **catalyst** platinum rhodium; **ceria zirconia oxygen storage** automotive **catalyst**

IT Air pollution
(control; reactor evaluation of **ceria-zirconia** as an **oxygen storage** material for automotive **catalysts**)

IT Exhaust gas **catalytic** converters
(reactor evaluation of **ceria-zirconia** as an **oxygen storage** material for automotive **catalysts**)

IT 115232-99-0, Cerium **zirconium oxide** ce0.75zr0.25o2
RL: CAT (Catalyst use); USES (Uses)
(Reactor evaluation of **ceria-zirconia** as an **oxygen storage** material for automotive **catalysts**)

IT **1314-23-4, Zirconium oxide (ZrO2)**, uses **1344-28-1, Aluminum oxide (Al2O3)**, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(reactor evaluation of **ceria-zirconia** as an

oxygen storage material for automotive **catalysts**)

IT **1314-23-4, Zirconium oxide (ZrO2)**, uses **1344-28-1, Aluminum oxide (Al2O3)**, uses
RL: CAT (Catalyst use); USES (Uses)
(reactor evaluation of **ceria-zirconia** as an **oxygen storage** material for automotive **catalysts**)

L64 ANSWER 18 OF 26 HCA COPYRIGHT 2003 ACS on STN
128:274460 **Catalyst** composition containing **oxygen storage** components. Wu, Joseph H. Z.; Sung, Shiang; Hu, Zhicheng; Steger, John J. (Engelhard Corp., USA). PCT Int. Appl. WO 9813139 A1 **19980402**, 41 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1997-US16254 19970915. PRIORITY: US 1996-722761 19960927.

AB The present invention relates to a zirconium, rare earth contg. compn. comprising zirconium, cerium, neodymium and praseodymium components and the use of this compn. in a **catalyst** compn. useful for the treatment of gases to reduce contaminants contained therein and method process to **make** the **catalyst** compn. The **catalyst** has the capability of substantially simultaneously **catalyzing** the oxidn. of hydrocarbons and carbon monoxide and the redn. of nitrogen oxides.

IC ICM B01J023-10
ICS B01J023-63; B01D053-94

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST exhaust gas **catalyst oxygen storage** component

IT Aluminosilicates, uses
Rare earth metals, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** compn. contg. **oxygen storage** components)

IT Hydrocarbons, processes
RL: REM (Removal or disposal); PROC (Process)
(**catalyst** compn. contg. **oxygen storage** components)

IT **Catalysts**
(three-way; **catalyst** compn. contg. **oxygen storage** components)

IT 1304-28-5, Barium oxide, uses **1306-38-3, Ceria**, uses 1308-38-9, Chromia, uses 1312-81-8, Lanthana 1313-97-9, Neodymia 1314-11-0, Strontium oxide, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-95-4, Magnesium, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-10-0, Praseodymium, uses 7440-24-6, Strontium, uses 7440-39-3, Barium, uses 7440-45-1, Cerium, uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses **7631-86-9, Silica**, uses **12036-32-7**, Praseodymia **13463-67-7**, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** compn. contg. **oxygen storage**

components)
IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: REM (Removal or disposal); PROC (Process)
(**catalyst** compn. contg. **oxygen storage** components)
IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses **7631-86-9, Silica**, uses **12036-32-7**, Praseodymia **13463-67-7**, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** compn. contg. **oxygen storage** components)

L64 ANSWER 19 OF 26 HCA COPYRIGHT 2003 ACS on STN
126:175461 An XRD and TEM investigation of the structure of **alumina**-supported **ceria-zirconia**. Yao, M. H.; Baird, R. J.; Kunz, F. W.; Hoost, T. E. (Physics Dept., Ford Res. Labs., Ford Motor Co., Dearborn, MI, 48121-2053, USA). Journal of Catalysis, 166(1), 67-74 (English) **1997**. CODEN: JCTLA5. ISSN: 0021-9517. Publisher: Academic.
AB Dispersed **CeO2-ZrO2** is of interest as a thermally stable **oxygen-storage** component of automotive **catalysts**. **Alumina**-supported **CeO2-ZrO2** samples were **prepd.** by co-impregnation in order to maximize the interaction between Zr and Ce. The phases present, their **particle** sizes and the interactions among the phases of fresh, steam-aged and reduced samples were investigated by XRD and TEM. In the fresh samples, a **particulate** solid soln. phase ZrxCe1-xO2 of cubic symmetry was identified. However, the zirconium concn. of this **particulate** phase was found to be smaller than that expected from the Zr loading. This suggests the existence of finely dispersed **zirconia** on the **Al2O3** surface. For the steam-aged samples, a second Ce-**Zr oxide** solid soln. phase of higher Zr concn. and tetragonal symmetry was found in addn. to the original **CeO2**-based cubic solid soln. The appearance of this second phase may have resulted from sintering of the highly dispersed **zirconia**. The highly dispersed **zirconia** may also be responsible for preventing reaction between **CeO2** and the **Al2O3** support, since CeAlO3 was found only in high-temp. reduced samples without **zirconia**. The **particle** sizes of the various phases were measured by XRD and TEM. The **particle** size of the supported **particulate** phase decreased with increasing zirconium loading, but a discrepancy was noted between the XRD and the TEM results. This discrepancy is discussed in terms of compositional inhomogeneity in the ZrxCe1-xO2 solid soln. phase.
CC 57-2 (Ceramics)
Section cross-reference(s): 67
ST **alumina** supported **ceria zirconia** automotive **catalyst**
IT **Catalysts**
(automotive; **prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)
IT Microstructure
Particle size
(**prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)
IT Aging, materials

(steam; **prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

IT **1306-38-3, Cerium oxide (CeO2)**, processes **1314-23-4, Zirconia**, processes **1344-28-1, Alumina**, processes 65453-23-8, Cerium **zirconium oxide**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

IT **1306-38-3, Cerium oxide (CeO2)**, processes **1314-23-4, Zirconia**, processes **1344-28-1, Alumina**, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

L64 ANSWER 20 OF 26 HCA COPYRIGHT 2003 ACS on STN
126:93844 New **generation** of rare earth compounds for automotive **catalysis**. Cuif, Jean-Pierre; Blanchard, Gilbert; Touret, Olivier; Marczi, Mike; Quemere, Eric (Rhone-Poulenc, Fr.). Society of Automotive Engineers, [Special Publication] SP, SP-1207(Emissions and Emissions Control), 73-81 (English) **1996**. CODEN: SAESA2. ISSN: 0099-5908. Publisher: Society of Automotive Engineers.

AB Rare earths compds., esp. **CeO2**, are widely used in automotive **catalysis**. **CeO2** contributes to precious metal stabilization, but is particularly well known to be the active component for O storage capacity (OSC). Std. **CeO2** has poor thermal stability at temps. >800.degree.. A new **generation** of metal-based oxides was studied possessing high thermal and OSC stability. It was demonstrated that com. available Ce-rich solid solns. of (Ce, Zr)O2 showed the highest surface areas with remarkably improved OSC and phase stability vs. temp.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST exhaust gas rare earth **catalyst; ceria zirconia catalyst** exhaust gas; **oxygen storage** capacity exhaust gas **catalyst**

IT Exhaust gases (engine)
(platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)

IT Rare earth oxides
RL: CAT (Catalyst use); USES (Uses)
(platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)

IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(alone and with **ceria**; platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)

IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); USES (Uses)
(alone and with **zirconia**; platinum addn. effect on improved thermal stability and **oxygen storage** capacity of

automotive exhaust gas **catalysts** contg. rare earth oxides)
IT **7631-86-9, Silica**, uses
RL: CAT (Catalyst use); USES (Uses)
(**ceria** stabilized with; platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)
IT 140418-71-9, Cerium **zirconium oxide** (Ce0.6Zr0.4O2)
RL: CAT (Catalyst use); USES (Uses)
(platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)
IT 7782-44-7, Oxygen, miscellaneous
RL: MSC (Miscellaneous)
(platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)
IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(alone and with **ceria**; platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)
IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); USES (Uses)
(alone and with **zirconia**; platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)
IT **7631-86-9, Silica**, uses
RL: CAT (Catalyst use); USES (Uses)
(**ceria** stabilized with; platinum addn. effect on improved thermal stability and **oxygen storage** capacity of automotive exhaust gas **catalysts** contg. rare earth oxides)

L64 ANSWER 21 OF 26 HCA COPYRIGHT 2003 ACS on STN
125:229418 **Manufacture** of automotive **catalysts** with improved **oxygen storage** and metal dispersion. Shelef, Mordecai; Usmen, Rengin K.; Graham, George W.; Watkins, William L. H.; Mccabe, Robert W. (Ford Motor Co., USA). U.S. US 5556825 A **19960917**, 9 pp. (English). CODEN: USXXAM. APPLICATION: US 1995-369635 19950106.
AB The process includes the steps of providing a substrate, providing a .gamma.-**alumina** support material, depositing a lantana precursor and calcining the precursor, depositing an **oxygen storage** material precursor, e.g., **ceria** precursor and calcining this precursor material, and subsequently depositing **catalytic** material, e.g., platinum on the **oxygen storage** material. The **alumina** may be initially wash coated on the substrate or at any stage after deposition of the lantana precursor.
IC ICM B01J023-63
NCL 502303000
CC 59-3 (Air Pollution and Industrial Hygiene)
ST exhaust gas treatment **catalyst manuf**; **oxygen storage catalyst** exhaust gas
IT Exhaust gases
(**manuf**. of automotive **catalysts** with improved

oxygen storage and metal dispersion)
IT **1306-38-3, Cerium oxide (CeO2)**, uses
1312-81-8, **Lanthanum oxide (La2O3)**
1314-23-4, Zirconia, uses **1344-28-1,**
Aluminum oxide (Al2O3), uses 7440-05-3,
Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
12036-32-7, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(**manuf.** of automotive **catalysts** with improved
oxygen storage and metal dispersion)
IT 10099-59-9, Lanthanum nitrate 10361-80-5, Praseodymium nitrate
17309-53-4, Cerium nitrate
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process);
PROC (Process); USES (Uses)
(**manuf.** of automotive **catalysts** with improved
oxygen storage and metal dispersion)
IT **1306-38-3, Cerium oxide (CeO2)**, uses
1314-23-4, Zirconia, uses **1344-28-1,**
Aluminum oxide (Al2O3), uses
12036-32-7, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(**manuf.** of automotive **catalysts** with improved
oxygen storage and metal dispersion)

L64 ANSWER 22 OF 26 HCA COPYRIGHT 2003 ACS on STN
125:122168 **Catalyst** for treatment of exhaust gases and its **manufacture**. Kimura, Mareo; Matsuoka, Yoriko; Sobukawa, Hideo; Fukui, Masayuki; Suda, Akihiko; Kandori, Toshio; Ukyo, Yoshio (Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan). Eur. Pat. Appl. EP 715879 A1 **19960612**, 19 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1995-119403 19951208. PRIORITY: JP 1994-306265 19941209; JP 1995-113789 19950413.
AB The **catalyst** comprises **cerium oxide** or a solid soln. contg. **cerium oxide** and **zirconium oxide**, and noble metal loaded on porous support. The **cerium oxide** or the solid soln. has an av. **particle** diam. of 5-100 nm. The **cerium oxide** is present in the solid soln. at 0.2-4.0 molar ratio with respect to the **zirconium oxide**. The **catalyst** can be **prepd.** by coating the support with a slurry of a **cerium oxide** sol, or a **cerium oxide** sol and a **zirconium oxide** sol, calcining the slurry, and loading noble metal. The **cerium oxide** or its solid soln. has a surface area large enough to effect an **oxygen storage** function, and has an av. **particle** diam. large enough to prevent the same from entering deeply into **fine** pores of a porous support, thereby providing a **catalyst** fully exhibiting both of the **oxygen storage** capability and the **catalytic** activity.
IC ICM B01D053-94
ICS B01J023-56; B01J021-06; B01J023-63
CC 59-3 (Air Pollution and Industrial Hygiene)
ST exhaust gas treatment **catalyst manuf**
IT Exhaust gases
(**catalyst** for treatment of exhaust gases and its **manuf.**)
IT Platinum-group metals
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT **Catalysts** and **Catalysis**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT Hydrocarbons, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT **1314-23-4, Zirconium oxide (ZrO2)**, uses **1344-28-1, Alumina**, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses **7631-86-9, Silica**, uses 11129-18-3, **Cerium oxide 13463-67-7, Titania**, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT 630-08-0, Carbon monoxide, processes 10102-43-9, Nitrogen oxide (NO), processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT 56-81-5, 1,2,3-Propanetriol, processes 107-21-1, 1,2-Ethanediol, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(reducing agent; **catalyst** for treatment of exhaust gases and its **manuf.**)

IT **1314-23-4, Zirconium oxide (ZrO2)**, uses **1344-28-1, Alumina**, uses **7631-86-9, Silica**, uses **13463-67-7, Titania**, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

L64 ANSWER 23 OF 26 HCA COPYRIGHT 2003 ACS on STN
114:69843 **Oxygen storage** capacity of **cerium oxides** in **ceria/alumina** containing precious metals. Miki, Takeshi; Haneda, Masaaki; Kakuta, Noriyoshi; Ueno, Akifumi; Tateishi, Syuji; Matsuura, Shinji; Sato, Masayasu (Dep. Mater. Sci., Toyohashi Univ. Technol., Toyohashi, 440, Japan). Shokubai, 32(6), 422-5 (Japanese) **1990**. CODEN: SHKUAJ. ISSN: 0559-8958.

AB Addn. of precious metals (PM; Pt, Rh) on **CeO2/Al2O3** and **CeO2/La2O3/Al2O3** enhanced their O storage capacities (OSC). Increments in the OSC of the **CeO2/La2O3/Al2O3 catalysts** were much greater than those in the **CeO2/Al2O3** samples. The enhanced OSC is ascribed to the interaction between PM and a **CeO2-La2O3** solid soln. **formed** during **catalyst prepn.** No enhancements in the OSC were obsd. on phys. mixing of **CeO2/La2O3/Al2O3** and Pt-Rh/**Al2O3**, although the compn. ratio of PM:**CeO2**:**La2O3** was the same. This indicates that the intimate contacts between the precious metals and **CeO2 particles** dispersed on **Al2O3** are essential for the enhanced OSC of **CeO2**.

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

ST **oxygen storage** platinum rhodium **ceria alumina**; platinum **ceria** lanthana **alumina catalyst**; rhodium **ceria** lanthana **alumina catalyst**

IT **Catalysts** and **Catalysis**
(**ceria**-lanthana-**alumina**, **oxygen** **storage** capacity of, effects of addn. of platinum or rhodium on)
IT Adsorption
(of oxygen, on **ceria**-lanthana-**alumina** **catalyst**, effects of addn. of platinum or rhodium on)
IT 7782-44-7, Oxygen, properties
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(adsorption of, on **ceria**-lanthana-**alumina** **catalyst**, effect of addn. of platinum or rhodium on)
IT 1312-81-8, Lanthanum sesquioxide
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** from **ceria** and **alumina** and, effect of addn. of platinum or rhodium on **oxygen** **storage** capacity of)
IT 7440-06-4, Platinum, uses and miscellaneous 7440-16-6, Rhodium, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** from **ceria** and lanthana and **alumina** and, **oxygen storage** capacity of)
IT **1306-38-3, Cerium dioxide**, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** from lanthana and **alumina** and, effect of addn. of platinum or rhodium on **oxygen storage** capacity of)
IT **1306-38-3, Cerium dioxide**, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** from lanthana and **alumina** and, effect of addn. of platinum or rhodium on **oxygen storage** capacity of)

L64 ANSWER 24 OF 26 HCA COPYRIGHT 2003 ACS on STN
113:84018 Enhanced **oxygen storage** capacity of **cerium oxides** in **cerium dioxide**/**lanthanum** sesquioxide/**alumina** containing precious metals. Miki, Takeshi; Ogawa, Takao; Haneda, Masaaki; Kakuta, Noriyoshi; Ueno, Akifumi; Tateishi, Syuji; Matsuura, Shinji; Sato, Masayasu (Dep. Mater. Sci., Toyohashi Univ. Technol., Toyohashi, 440, Japan). Journal of Physical Chemistry, 94(16), 6464-7 (English) **1990**. CODEN: JPCHAX. ISSN: 0022-3654.
AB The addn. of precious metals (PM: Pt, Rh) on **CeO2/Al2O3** and **CeO2/La2O3/Al2O3** increased the O storage capacities (OSC). Increments in the OSC of the PM-doped **CeO2/La2O3/Al2O3** **catalysts** were much greater than those in the OSC of the PM-doped **CeO2/Al2O3**. The enhanced OSC is ascribed to the interaction between the PM and a **CeO2-La2O3** solid soln. **formed** during the catalyst prepn. No enhancements in the OSC were obsd. on phys. mixing of **CeO2/La2O3/Al2O3** and Pt-Rh/**Al2O3**, although the compn. ratio of the PM:**CeO2**:**La2O3** phys. mixt. is the same as that in the PM-doped **CeO2**/**La2O3/Al2O3**. This indicates that the intimate contacts between the precious metals and **CeO2** **particles** dispersed on **Al2O3** are essential for the enhanced OSC of **Ce oxides**.
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST **oxygen storage** capacity exhaust **catalyst**; **cerium oxide** exhaust **catalyst** oxygen; **lanthanum oxide** exhaust **catalyst** oxygen; platinum exhaust **catalyst** oxygen capacity; rhodium exhaust **catalyst** oxygen capacity

IT Exhaust gases
(**catalysts** for treatment of, three-way, **cerium oxide** and **cerium oxide-lanthanum** sesquioxide, **oxygen storage** capacity of, enhancement of, by addn. of platinum and rhodium)

IT Oxidation **catalysts**
Reduction **catalysts**
(**cerium oxide** and **cerium oxide-lanthanum** sesquioxide, for exhaust gas treatment, **oxygen storage** capacity of, enhancement of, by addn. of platinum and rhodium)

IT **Catalysts** and **Catalysis**
(three-way, **cerium oxide** and **cerium oxide-lanthanum** sesquioxide, for exhaust gas treatment, **oxygen storage** capacity of, enhancement of, by addn. of platinum and rhodium)

IT **1306-38-3, Cerium oxide (CeO2)**, uses and miscellaneous **1306-38-3D, Cerium oxide (CeO2)**, solid solns. with **lanthanum oxide** 1312-81-8D, **Lanthanum oxide (La2O3)**, solid solns. with **cerium oxide**
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**, on **alumina** support, for exhaust gas treatment, **oxygen storage** capacity of, enhancement of, by platinum-rhodium addn.)

IT 7440-06-4, Platinum, uses and miscellaneous
RL: USES (Uses)
(**cerium oxide** and **cerium oxide-lanthanum** sesquioxide exhaust gas treatment **catalyst** doping with rhodium and, for enhanced **oxygen storage** capacity)

IT 7440-16-6, Rhodium, uses and miscellaneous
RL: USES (Uses)
(**cerium oxide** and **cerium oxide-lanthanum** sesquioxide exhaust gas treatment **catalysts** doping with platinum and, for enhanced **oxygen storage** capacity)

IT 7782-44-7, Oxygen, uses and miscellaneous
RL: USES (Uses)
(storage capacity for, of **cerium oxide** and **cerium oxide-lanthanum** sesquioxide exhaust gas treatment **catalysts**, enhancement of, by addn. of platinum and rhodium)

IT **1306-38-3, Cerium oxide (CeO2)**, uses and miscellaneous **1306-38-3D, Cerium oxide (CeO2)**, solid solns. with **lanthanum oxide**
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**, on **alumina** support, for exhaust gas treatment, **oxygen storage** capacity of, enhancement of, by platinum-rhodium addn.)

L64 ANSWER 25 OF 26 HCA COPYRIGHT 2003 ACS on STN
112:83277 Layered automotive **catalytic** composite. Henk, Michael G.; Summers, Jack C., II (Allied-Signal, Inc., USA). U.S. US 4868148 A **19890919**, 8 pp. Cont.-in-part of U.S. Ser. No. 88,745, abandoned.

(English). CODEN: USXXAM. APPLICATION: US 1988-201245 19880601. PRIORITY: US 1987-88745 19870824.

AB The **catalytic** composite has a 1st support of a refractory inorg. oxide, e.g. **Al2O3**, **SiO2**, **TiO2**, ZrO, aluminosilicates, or their mixts., on which is dispersed .gtoreq.1 noble metal, i.e. Pt, Pd, Rh, Ru, or Ir, in the absence of an O component. An overlayer is dispersed on this; it contains an O storage component, e.g. an oxide of Fe, Ni, Co, or the rare earths, preferably CeO. An optional 2nd support of a refractory inorg. oxide may be dispersed as the top layer. The **catalyst** removes CO, NOx, and hydrocarbons from exhaust gases without **forming** H2S.

IC ICM B01J023-10
ICS B01J023-56; B01J023-76

NCL 502303000

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST exhaust gas **catalyst** compn

IT Exhaust gases
(**catalyst** retreatment of, reduced **formation** of hydrogen sulfide in)

IT **Catalysts** and **Catalysis**
(for exhaust gas treatment, reduced hydrogen sulfide **formation** in)

IT Rare earth oxides
RL: OCCU (Occurrence)
(**oxygen-storage** component, for exhaust gas **catalyst**)

IT 7439-88-5, Iridium, uses and miscellaneous 7440-05-3, Palladium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous 7440-16-6, Rhodium, uses and miscellaneous 7440-18-8, Ruthenium, uses and miscellaneous 7440-45-1, Cerium, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(**catalysts** contg., for exhaust gas treatment)

IT 1312-81-8, **Lanthanum oxide** 1313-99-1, Nickel oxide, uses and miscellaneous 11104-61-3, Cobalt oxide 11129-18-3, **Cerium oxide** 1332-37-2, Iron oxide, uses and miscellaneous
RL: OCCU (Occurrence)
(**oxygen-storage** component, for exhaust gas **catalyst**)

IT 630-08-0, Carbon monoxide, uses and miscellaneous 11104-93-1, Nitrogen oxide, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from exhaust gases, **catalysts** for, reduced hydrogen sulfide **formation** in)

IT **1314-23-4**, **Zirconia**, uses and miscellaneous
13463-67-7, Titania, uses and miscellaneous
RL: USES (Uses)
(support, for exhaust gas **catalysts**, with **oxygen-storage** components)

IT **1314-23-4**, **Zirconia**, uses and miscellaneous
13463-67-7, Titania, uses and miscellaneous
RL: USES (Uses)
(support, for exhaust gas **catalysts**, with **oxygen-storage** components)

L64 ANSWER 26 OF 26 HCA COPYRIGHT 2003 ACS on STN
107:83175 **Catalysts** for exhaust gases. Ihara, Kazunori; Okubo, Kenji; Kurita, Hideaki; Yazaki, Shigeru; Yoshino, Yasutaka (Mazda Motor Corp., Japan; Tokyo Roki Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 62071538

A2 **19870402** Showa, 5 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1985-211635 19850924.

AB The title **catalysts** contain layers contg. Pt, Pd, and/or Rh loaded on carriers and **Al2O3**-coating layers (placed on the **catalyst** layers) contg. oxides of Ce, Ni, Mo, and/or Fe [which act as **oxygen-storing** capacity-conferring agent (OSC)] and 1-10% oxides of La and/or Nd. The **catalysts** are used for removal of CO, hydrocarbons, and NOx from exhaust gases. Thus, a cordierite honeycomb carrier was soaked in a slurry contg. .gamma.-**Al2O3**, boehmite, water, and HNO3, dried, and baked at 550.degree. to obtain an **Al2O3**-coated carrier, which was soaked in aq. chloroplatinic acid/RhCl3 mixt., dried, and baked at 600.degree. to obtain a carrier (A) supporting Pt 1.0 and Rh 0.2 g/L. Then, hydrated **Al2O3**, **La2O3**, **Ce oxide**, and water were kneaded to obtain a slurry for the OSC coating, into which A was soaked, dried, and baked at 700.degree. to **form** a coating layer contg. **Ce oxide** 80, **La2O3** 5, and .gamma.-**Al2O3** 15% on the surface of the **catalyst** layer contg. Pt and Rh **formed** on the carrier. The resulting **catalyst** was used for an exhaust gas showing good removal rates for CO, hydrocarbons, and NOx.

IC ICM B01J023-56
ICS B01D053-36; B01J023-64; B01J023-89

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST **catalyst** three way exhaust gas; **cerium oxide** exhaust gas **catalyst**; lanthanum exhaust gas **catalyst**; platinum exhaust gas **catalyst**; rhodium exhaust gas **catalyst**; **alumina** exhaust gas **catalyst**

IT Exhaust gases
(**catalysts** for, for removal of carbon monoxide and hydrocarbons and nitrogen oxides)

IT **Catalysts** and **Catalysis**
(multifunctional, for exhaust gases, for removal of carbon monoxide and hydrocarbons and nitrogen oxides)

IT 1309-37-1, Iron oxide, biological studies 1313-27-5, Molybdenum oxide, uses and miscellaneous 1317-61-9, Iron oxide, biological studies 1332-37-2, Iron oxide, uses and miscellaneous **1344-28-1**, **Alumina**, uses and miscellaneous 1345-25-1, Iron oxide, biological studies 7439-91-0, Lanthanum, uses and miscellaneous 7440-00-8, Neodymium, uses and miscellaneous 7440-05-3, Palladium, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous 7440-16-6, Rhodium, uses and miscellaneous 11099-02-8, Nickel oxide 11129-18-3, **Cerium oxide**
RL: CAT (Catalyst use); USES (Uses)
(exhaust gas **catalysts** contg., for removal of carbon monoxide and hydrocarbons and nitrogen oxides)

IT 630-08-0
RL: OCCU (Occurrence)
(exhaust gases, **catalysts** for, for removal of carbon monoxide and hydrocarbons and nitrogen oxides)

IT 630-08-0, Carbon monoxide, uses and miscellaneous 11104-93-1, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from exhaust gases, three-way **catalysts** for)

IT **1344-28-1**, **Alumina**, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(exhaust gas **catalysts** contg., for removal of carbon monoxide and hydrocarbons and nitrogen oxides)

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These answers may have good dates. I searched on 2001, so the publication or patent could have a publication date after 02/23/01.

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=> d L65 1-16 cbib abs hitind hitrn

L65 ANSWER 1 OF 16 HCA COPYRIGHT 2003 ACS on STN
138:406061 Diesel **particulate** filter capable of burning **particulates** and purifying nitrogen oxides. Ogura, Yoshiji (Toyota Motor Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2003161137 A2 20030606, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-360911 20011127.

AB The **particulate** filter is constituted by a plurality of parallelly arranged long cells whose terminal end is alternately closed so as to that the exhaust gas pass through the cell walls, wherein the cell walls have double-layer coatings consisting of lower coating layers (A) **made** of oxide supports carrying NOx absorbers and noble metals, and upper coating layers (B) **made** of oxides capable of **absorbing** and desorbing **oxygen** and carrying noble metals. The structure shows high and durable ability for burning **particulates**, and prevents sulfur poisoning of the NOx absorbers.

IC ICM F01N003-02
ICS B01D039-14; B01D039-20; B01D053-94; B01J023-58; F01N003-08; F01N003-10; F01N003-24; F01N003-28

CC 59-3 (Air Pollution and Industrial Hygiene)

ST diesel **particulate** filter nitrogen oxide absorber; noble metal **catalyst** diesel **particulate** filter; oxygen release diesel **particulate** filter

IT Noble metals
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT Exhaust **particles** (engine)
(diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT Filters
(exhaust gas; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT Absorbents
(for NOx, in lower coating layer; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT Reduction **catalysts**
(for NOx, noble metals; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT Exhaust gases (engine)
(**particulate** filters for; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT 7439-93-2, Lithium, uses 7440-09-7, Potassium, uses
RL: TEM (Technical or engineered material use); USES (Uses)

(NOx absorber, in lower coating layer; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT **1306-38-3, Ceria**, uses 1332-37-2, Iron oxide, uses 65453-23-8, Cerium **zirconium oxide** 154985-41-8, Aluminum cerium **zirconium oxide**
RL: TEM (Technical or engineered material use); USES (Uses)
(capable of **absorbing** and desorbing **oxygen**, in upper coating layer; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst**, in lower coating layer; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT 11104-93-1, Nitrogen oxide, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses **13463-67-7, Titania**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(in lower coating layer; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT 7782-44-7, Oxygen, miscellaneous
RL: MSC (Miscellaneous)
(upper coating layer capable of **absorbing** and desorbing **oxygen**; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT **1306-38-3, Ceria**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(capable of **absorbing** and desorbing **oxygen**, in upper coating layer; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

IT **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses **13463-67-7, Titania**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(in lower coating layer; diesel **particulate** filter with double-coating-layer cell structure for burning **particulates** and purifying NOx)

L65 ANSWER 2 OF 16 HCA COPYRIGHT 2003 ACS on STN

138:275470 Exhaust articles for internal combustion engines. Hu, Zhicheng; Burk, Patrick L.; Chen, Shau-Lin F.; Rabinowitz, Harold N.; Minnella, Christopher M.; Israel, Aaron N. (USA). U.S. Pat. Appl. Publ. US 2003061860 A1 20030403, 17 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-968192 20011001.

AB Provided is a base metal undercoat contg. **catalyst** and an exhaust article contg. the **catalyst**. The **catalyst** contains a base metal undercoat with an **oxygen storage** component, and at least one **catalytic** layer. Also provided are methods for **prepg.** the **catalyst** and methods for monitoring the **oxygen storage** capacity of an exhaust article contg. the **catalyst**.

IC ICM G01N007-00

NCL 073023310
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
ST monitoring **oxygen storage** capacity exhaust gas **catalyst** oxygen sensor; three way **catalyst** **oxygen storage** capacity engine exhaust treatment
IT **Catalyst** supports
(honeycomb; exhaust articles for internal combustion engines)
IT Exhaust gas **catalytic** converters
(**oxygen storage catalyst**; exhaust articles for internal combustion engines)
IT **Catalysts**
(three-way; exhaust articles for internal combustion engines)
IT **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(activated; **catalyst** support; exhaust articles for internal combustion engines)
IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(exhaust articles for internal combustion engines)
IT 1304-28-5, Barium oxide, uses 1305-78-8, Calcium oxide, uses 1309-48-4, Magnesium oxide, uses 1314-11-0, Strontium oxide, uses 7439-91-0, Lanthanum, uses 7440-00-8, Neodymium, uses 65453-23-8, Cerium **zirconium oxide**
RL: CAT (Catalyst use); USES (Uses)
(first layer component; exhaust articles for internal combustion engines)
IT **1306-38-3, Ceria**, uses 7440-10-0, Praseodymium, uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen storage catalyst**; exhaust articles for internal combustion engines)
IT **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(activated; **catalyst** support; exhaust articles for internal combustion engines)
IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(exhaust articles for internal combustion engines)
IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen storage catalyst**; exhaust articles for internal combustion engines)

L65 ANSWER 3 OF 16 HCA COPYRIGHT 2003 ACS on STN
138:209401 Composite oxide, process for **producing** the same, and exhaust gas reducing **catalyst**. Morikawa, Akira; Nagai, Yasutaka; Tanabe, Toshitaka; Suzuki, Tadashi; Suda, Akihiko; Sobukawa, Hideo (Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan). Eur. Pat. Appl. EP 1287876 A2 20030305, 17 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2002-18807 20020822. PRIORITY: JP 2001-261260 20010830; JP 2002-74719 20020318.
AB A composite oxide includes CeO2, ZrO2 and a metallic oxide being free from reacting with CeO2 and ZrO2 at 700 .degree.C or more, preferably at 900 .degree.C or more and further preferably at 1000 .degree.C or more. The composite oxide has a regulatory oriented phase, such as a pyrochlore phase, etc., in which at least a part of Ce cations and Zr cations are oriented regularly. The composite oxide **makes** a **catalytic** support. The

CeO2-ZrO2 composite oxide and the reaction-free metallic oxide **make** barriers each other which suppress the **granular** growth when the composite oxide is subjected to high-temp. heat in a reducing heat treatment to **form** the regulatory oriented phase. The regulatory oriented phase improves the **oxygen storage**-and-release capability of the **catalytic** support. Thus, it is possible to simultaneously attain a large a sp. surface area and a high **oxygen storage** -and-release capability.

IC ICM B01D053-94
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
ST **alumina ceria zirconia** pyrochlore **oxygen storage catalyst** engine exhaust; composite oxide regulatory oriented phase **oxygen storage** exhaust treatment
IT Exhaust gas **catalytic** converters
(**O2 storage catalyst; alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)
IT Exhaust gases (engine)
Hydrothermal crystallization
Pyrochlore-type crystals
(**alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)
IT Hydrocarbons, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(**alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)
IT Heat treatment
(in reducing atm.; **alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)
IT **Catalysts**
(three-way; **alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)
IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(**alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)
IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide (NOx), processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(**alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)
IT 7782-44-7, **Oxygen**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**storage** and release of; **alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(**alumina-ceria-zirconia oxygen storage catalyst** support for engine exhaust treatment)

L65 ANSWER 4 OF 16 HCA COPYRIGHT 2003 ACS on STN
138:60510 **Catalyst particles** and method of **manufacturing** the same. Ito, Miho; Hasegawa, Jun; Niihara, Koichi; Nakayama, Tadachika (Japan). U.S. Pat. Appl. Publ. US 2003004054 A1 20030102, 12 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-185355 20020627. PRIORITY: JP 2001-199129 20010629; JP 2002-117587 20020419.

AB **Catalyst particles** having a higher activity and capable of showing activities for a plurality of kinds of material are provided. The **catalyst particles** of the invention comprise base **particles** that consist of one kind of single material **fine particles** or two or more kinds of solid soln. **fine particles** having primary **particle** diams. of a nanometer order, and a surface coating of either **particles** or a layer **made** of one or more kind of noble metal, or an oxide of noble metal, that covers at least a part of the surface of the base **particles** to a thickness of one to thirty single atom layers. In the method of **manufg.** the **catalyst particles** described above, two or more kinds of raw materials are evapd. at the same time in a vacuum chamber using a resistive heating process, so as to **form** the base **particles** that are covered, on at least a part of the surface thereof, with the one or more kind of metal or a deriv. thereof. **Manufg.** the **catalyst particles** involves evapg. said raw materials onto the **particles** and in a resistive heating process.

IC ICM B01J021-18
NCL 502178000; 502180000
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 52, 67
ST nanoparticle **catalyst manuf** sintering prevention; fuel cell nanoparticle **catalyst**; automobile exhaust nanoparticle **catalyst ceria oxygen storage** platinum
IT Exhaust gas **catalytic** converters
(**O2 storage catalysts**; **manuf.** of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)
IT Nanoparticles
(**catalytic**; **manuf.** of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)
IT Evaporation
Fuel cells
(**manuf.** of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)
IT Solid solutions
(of metals, metal oxides and/or their derivs., as base particle and/or coating material; **manuf.** of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)
IT Sintering

(prevention of; **manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

IT Exhaust gases (engine)
(treatment of; **manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

IT 7782-44-7, Oxygen, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(adsorption and release of by the inventive **particles**; **manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

IT 1305-78-8, Calcium oxide, uses 1305-78-8D, Calcium oxide, derivs 1314-13-2, Zinc oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(anti-sintering material; **manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

IT **1306-38-3, Ceria**, uses **1306-38-3D, Cerium oxide (CeO2)**, derivs. 1309-48-4, Magnesium oxide, uses 1309-48-4D, Magnesium oxide (MgO), derivs. 1314-11-0, Strontia, uses 1314-11-0D, Strontium oxide (SrO), derivs. 1314-35-8, Tungsten oxide, uses 1314-35-8D, Tungsten oxide (WO3), derivs. **1344-28-1, Alumina**, uses **1344-28-1D, Aluminum oxide (Al2O3)**, derivs.
RL: CAT (Catalyst use); USES (Uses)
(base **particle** and/or anti-sintering material; **manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

IT 409-21-2, Silicon carbide, uses 409-21-2D, Silicon carbide (SiC), derivs. **1314-23-4, Zirconia**, uses **1314-23-4D, Zirconium oxide (ZrO2)**, derivs. **7631-86-9, Silica**, uses **7631-86-9D, Silica**, derivs. 7782-42-5, Graphite, uses 7782-42-5D, Graphite, derivs. **13463-67-7, Titania**, uses **13463-67-7D, Titanium oxide (TiO2)**, derivs.
RL: CAT (Catalyst use); USES (Uses)
(base **particle** material; **manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

IT 1314-08-5, Palladium oxide 1314-13-2D, Zinc oxide, derivs. 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-57-5, Gold, uses 11113-84-1, Ruthenium oxide 11129-89-8, Platinum oxide 12680-36-3, Rhodium oxide 20667-12-3, Silver oxide 39403-39-9, Gold oxide
RL: CAT (Catalyst use); USES (Uses)
(**manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

IT **1306-38-3, Ceria**, uses **1306-38-3D, Cerium oxide (CeO2)**, derivs. **1344-28-1, Alumina**, uses **1344-28-1D, Aluminum oxide (Al2O3)**, derivs.
RL: CAT (Catalyst use); USES (Uses)
(base **particle** and/or anti-sintering material; **manuf**. of nanoparticulate **catalysts** for use in applications such

as automobile exhaust **catalysts** and fuel cells)

IT **1314-23-4, Zirconia**, uses **1314-23-4D**, **Zirconium oxide (ZrO2)**, derivs. **7631-86-9, Silica**, uses **7631-86-9D**, **Silica**, derivs. **13463-67-7, Titania**, uses **13463-67-7D, Titanium oxide (TiO2)**, derivs.
RL: CAT (Catalyst use); USES (Uses)
(base **particle** material; **manuf**. of nanoparticulate **catalysts** for use in applications such as automobile exhaust **catalysts** and fuel cells)

L65 ANSWER 5 OF 16 HCA COPYRIGHT 2003 ACS on STN
137:388461 Exhaust treatment **catalyst** suitable for use at low temperature. Taniguchi, Shigeyoshi; Horiuchi, Makoto (ICT K. K., Japan; International Catalyst Technology, Inc.). Jpn. Kokai Tokkyo Koho JP 2002336703 A2 20021126, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-143487 20010514.

AB The **catalyst** comprises .gtoreq.1 of Pd, Pt, and Rh, heat-resistant inorg. oxides such as **alumina**, titania, **zirconia**, or **silica**, a **catalyst** active component **made** of **ZrO2** contg. **CeO2** and .gtoreq.1 oxides of Y, Ti, Cr, Mn, Fe, Co, Ni, Cu, Zn, Sn and In, and alk. earth metal oxides. The **ZrO2** contg. the additives has a tetragonal single crystal structure, an excellent **oxygen storage** capacity, and absorption/desorption functions at 400-500.degree.. The **catalyst** is suitable for removing NOx, CO, and hydrocarbons from exhaust at relatively low temps.

IC ICM B01J023-62
ICS B01D053-94; B01J023-89; F01N003-10; F01N003-20; F01N003-28

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST exhaust **catalyst zirconium oxide** tetragonal single crystal

IT Exhaust gases (engine)
Oxidation **catalysts**
(exhaust treatment **catalyst** suitable for use at low temp.)

IT Alkaline earth oxides
Noble metals
RL: CAT (Catalyst use); USES (Uses)
(exhaust treatment **catalyst** suitable for use at low temp.)

IT Hydrocarbons, processes
RL: REM (Removal or disposal); PROC (Process)
(exhaust treatment **catalyst** suitable for use at low temp.)

IT Crystal structure types
(tetragonal; exhaust treatment **catalyst** suitable for use at low temp.)

IT **1306-38-3, Cerium dioxide**, uses 1312-43-2, Indium oxide 1313-99-1, Nickel oxide, uses 1314-13-2, Zinc oxide, uses **1314-23-4, Zirconium dioxide**, uses **1314-36-9, Yttrium oxide**, uses 1332-29-2, Tin oxide 1332-37-2, Iron oxide, uses 1344-70-3, Copper oxide 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 11104-61-3, Cobalt oxide 11118-57-3, Chromium oxide 11129-60-5, Manganese oxide **13463-67-7, Titanium oxide**, uses
RL: CAT (Catalyst use); USES (Uses)
(exhaust treatment **catalyst** suitable for use at low temp.)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, NOx, processes

RL: REM (Removal or disposal); PROC (Process)
(exhaust treatment **catalyst** suitable for use at low temp.)

IT **1306-38-3, Cerium dioxide**, uses
1314-23-4, Zirconium dioxide, uses
1314-36-9, Yttrium oxide, uses
13463-67-7, Titanium oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(exhaust treatment **catalyst** suitable for use at low temp.)

L65 ANSWER 6 OF 16 HCA COPYRIGHT 2003 ACS on STN
137:221045 Stabilisation of nanostructured **CeO2-ZrO2** solid solutions by addition of **Al2O3**: a suitable way for **production** of thermally stable **oxygen storage**/release promoters for three-way **catalysts**. Di Monte, R.; Fornasiero, P.; Kaspar, J.; Graziani, M. (Dipartimento di Scienze Chimiche, Universita di Trieste, Trieste, 34127, Italy). Studies in Surface Science and Catalysis, 140(Oxide-Based Systems at the Crossroads of Chemistry), 229-236 (English) **2001**. CODEN: SSCTDM. ISSN: 0167-2991. Publisher: Elsevier Science B.V..

AB By impregnating .gamma.-**Al2O3** with cerium/zirconium citrate solns. and subsequent calcination nanostructured CemZr1-mO2 mixed oxides supported on **Al2O3** are obtained, which feature remarkably high **oxygen storage** even after a calcination at 1373 K for 24 h. Mutual thermal stabilization between **alumina** and solid solns. has been obsd., which prevents **formation** of .alpha.-**alumina** and sintering effects after a severe ageing.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST **ceria zirconia** nanostructured stabilization **alumina**

IT **Catalysts**
(three-way; stabilization of nanostructured **CeO2-ZrO2** by **Al2O3** as way for **prodn.** of thermally stable **oxygen storage**/release promoters for three-way **catalysts**)

IT 107068-45-1, Cerium **zirconium oxide** Ce0.2Zr0.8O2
140418-71-9, Cerium **zirconium oxide** Ce0.6Zr0.4O2
140418-73-1, Cerium **zirconium oxide** Ce0.8Zr0.2O2
RL: CAT (Catalyst use); USES (Uses)
(stabilization of nanostructured **CeO2-ZrO2** by **Al2O3** as way for **prodn.** of thermally stable **oxygen storage**/release promoters for three-way **catalysts**)

IT **1344-28-1, Alumina**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(stabilization of nanostructured **CeO2-ZrO2** by **Al2O3** as way for **prodn.** of thermally stable **oxygen storage**/release promoters for three-way **catalysts**)

IT **1344-28-1, Alumina**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(stabilization of nanostructured **CeO2-ZrO2** by **Al2O3** as way for **prodn.** of thermally stable **oxygen storage**/release promoters for three-way **catalysts**)

L65 ANSWER 7 OF 16 HCA COPYRIGHT 2003 ACS on STN
136:204543 Close-coupled **catalyst** for purifying exhaust gas and process for its **manufacture**.. Lindner, Dieter; Mussmann, Lothar; Votsmeier, Martin; Lox, Egbert; Kreuzer, Thomas (Omg A.-G. & Co.

K.-G., Germany). Eur. Pat. Appl. EP 1181970 A1 20020227, 11 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (German). CODEN: EPXXDW. APPLICATION: EP 2000-117618 20000816.

AB The invention relates to a start-up **catalytic** converter for purifying exhaust gases resulting from an internal combustion engine where the **catalyst** consists of palladium on **aluminum oxide** and from barium oxide. For the **catalyst** barium oxide and palladium are deposited together onto the substrate material of **aluminum oxide** in **fine** dispersion and the medium **particle** size of the palladium crystals is between 3 and 7. The small cryst. size of the palladium and the finely dispersed barium oxide deposited on the substrate enable the **catalyst** to maintain high activity and long term stability while stressed at high temp. The start-up **catalyst** may also have a second **catalytically** active coating which contains platinum and rhodium on **alumina** stabilized by lanthana as an **oxygen** a **storage** component applied onto the first **catalytically** active coating.

IC ICM B01D053-94
ICS B01J023-58

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST close coupled **catalyst** exhaust gas purifn

IT Exhaust gas **catalytic** converters
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT Hydrocarbons, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT **Catalyst** supports
(honeycomb, ceramic or metal; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT Exhaust gases (engine)
(internal combustion engine; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT **1306-38-3, Ceria**, uses 1312-81-8, Lanthana **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(**alumina** stabilizer; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT 1304-28-5, Barium oxide, uses **1344-28-1, Aluminum oxide**, uses 7440-05-3, Palladium, uses **12036-32-7, Praseodymium oxide**
RL: CAT (Catalyst use); USES (Uses)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen-storage** component; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf.**)

IT **1306-38-3, Ceria**, uses **1314-23-4,**

Zirconia, uses
RL: CAT (Catalyst use); USES (Uses)
(**alumina** stabilizer; close-coupled **catalyst** for purifying exhaust gas and process for its **manuf**.)

IT **1344-28-1, Aluminum oxide**, uses
12036-32-7, Praseodymium oxide
RL: CAT (Catalyst use); USES (Uses)
(close-coupled **catalyst** for purifying exhaust gas and process for its **manuf**.)

L65 ANSWER 8 OF 16 HCA COPYRIGHT 2003 ACS on STN
136:122534 Sol-gel Pd exhaust **catalysts** and N2O **production**. Salvesen, T.; Roesch, S.; Sermon, P. A.; Kaur, P. (Surface Reactivity Laboratory, Department of Chemistry, University of Surrey, Guildford, GU2 7XH, UK). Topics in Catalysis, 16/17(1-4), 381-384 (English) **2001**. CODEN: TOCAFI. ISSN: 1022-5528. Publisher: Kluwer Academic/Plenum Publishers.

AB **Al2O3, CeO2-Al2O3, CeO2**-Tb4O7-**Al2O3**, and **ZrO2-Al2O3** supported Pd samples have been **prepd**. by sol-gel methods. Extents and mechanisms of N2O **prodn**. in CO-NO and CO-NO-O2 reactions on these have been considered. This occurs most selectively under oxidizing (lean-burn) conditions or in the presence of **CeO2** and **CeO2**-Tb4O7 promoters near the CO-NO light off temp. Over Pd/**ZrO2-Al2O3** the CO-NO reaction at 573 K has CO and NO conversions that are second order with respect to pCO and pNO. Over this **catalyst** NO conversion is faster than that of CO until O2(g) is added, causing CO conversion and N2O **prodn**. at 573 K to rise simultaneously. **CeO2** or **CeO2**-Tb4O7 incorporation into a Pd/**Al2O3** **catalyst** enhances N2O **prodn**. near the CO-NO light-off temp. in the absence of added O2 without CO conversion being raised. There is current attention on pollution control opportunities through lean-burn conditions, Pd **catalysts** and **oxygen storage** capacity enhancement. The present work suggests that their role in N2O **prodn**. may need to be better understood and controlled. For the moment N2O **formation** provides a window on mechanisms of TWC operation.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67

ST nitrous oxide **prodn** palladium **catalyst**

IT Exhaust gas **catalytic** converters
(nitrous oxide **prodn**. over sol-gel palladium exhaust **catalysts**)

IT **Catalysts**
(three-way; nitrous oxide **prodn**. over sol-gel palladium exhaust **catalysts**)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses 7440-05-3, Palladium, uses 12037-01-3, **Terbium oxide** Tb4O7
RL: CAT (Catalyst use); USES (Uses)
(nitrous oxide **prodn**. over sol-gel palladium exhaust **catalysts**)

IT 10024-97-2, Nitrous oxide, **formation** (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(nitrous oxide **prodn**. over sol-gel palladium exhaust **catalysts**)

IT 630-08-0, Carbon monoxide, processes 10102-43-9, Nitric oxide, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(nitrous oxide **prodn**. over sol-gel palladium exhaust

catalysts)
IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(nitrous oxide **prodn**. over sol-gel palladium exhaust **catalysts**)

L65 ANSWER 9 OF 16 HCA COPYRIGHT 2003 ACS on STN
136:10017 Study of **CeO2-ZrO2** solid solution promoters modified by Nd. Yang, Zhibo; Lin, Peiyan; Wang, Wendong; Yu, Shouming (Department of Chemical Physics, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China). Cuihua Xuebao, 22(4), 365-369 (Chinese) **2001**. CODEN: THHPD3. ISSN: 0253-9837. Publisher: Kexue Chubanshe.
AB An external layer contg. Nd3+ inhibiting the sintering of the nanosized **CeO2-ZrO2** solid soln. was suggested. During calcination of this kind of double layer materials at 500-850.degree., part of the Nd3+ diffuses into the lattice of **CeO2-ZrO2** and the rest remains on the external surface of the nanosized **CeO2-ZrO2**. Then the segregation of Nd3+ on the surface is resulted. It may prevent from moving of the crystal bound and growing up of the crystal **grain**, thereby alleviate the sintering of the nanosized **CeO2-ZrO2 particles** and improve the **catalytic** performance of the **catalysts** contg. this kind of promoters. Two methods were used to dope the ions of Nd3+ into the **CeO2-ZrO2** solid soln. For the first route, the **ultrafine** .**CeO2-ZrO2** was impregnated with neodymium nitrate and neodymium-zirconium nitrate sol to **form** the protection layer, Nd2O3 and Nd0.1Zr0.9O2, resp. For the second route, the homogeneous **ultrafine** solid soln. of Ce0.65Zr0.25Nd0.1O2 was **prepd**. by the modified sol-gel method. The surface area and **oxygen storage** capacity of all the samples at 200.degree. were measured, and some samples were characterized by XRD and H2-TPR. It was showed that the samples which were modified by the first route possess higher ability to resist the sintering than those modified by the second one, and the optimum Nd content is 7%. The TWCs (three-way **catalysts**) contg. low content of precious metals (Pt, Pd and Rh) were also **prepd**. The supports were **prepd**. by mixing .gamma.-**Al2O3** with the **CeO2-ZrO2** solid solns. or with the modified **CeO2-ZrO2** contg. Nd3+. It was showed that the light-off temps. of all the fresh TWCs contg. (Ce-Zr-Nd)O2 reduced by 20-30.degree. from those of the TWCs with the unmodified supports. However, the improvement of the light-off temps. is not obvious for the aged TWCs (calcined at 850 .degree.C for 2 h) with modified supports contg. Nd3+.
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
ST **ceria zirconia** solid soln promoter modified neodymium exhaust **catalyst**
IT Exhaust gases (engine)
(**CeO2-ZrO2** solid soln. promoters modified by Nd for three-way **catalysts**)
IT **Catalysts**
(three-way; **CeO2-ZrO2** solid soln. promoters modified by Nd for)
IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(-**ZrO2**; **CeO2-ZrO2** solid soln. promoters modified by Nd for three-way **catalysts**)
IT **1314-23-4, Zirconium oxide (ZrO2)**,

uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**CeO2-**; **CeO2-ZrO2** solid soln. promoters
modified by Nd for three-way **catalysts**)
IT 7440-05-3, Palladium, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); USES (Uses)
(**CeO2-ZrO2** solid soln. promoters modified by Nd
for)
IT 7440-00-8, Neodymium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**CeO2-ZrO2** solid soln. promoters modified by Nd for
three-way **catalysts**)
IT 115-07-1, Propene, processes 630-08-0, Carbon monoxide, processes
10102-43-9, Nitric oxide, processes
RL: REM (Removal or disposal); PROC (Process)
(**CeO2-ZrO2** solid soln. promoters modified by Nd for
three-way **catalysts**)
IT 1313-97-9, Neodymium oxide (Nd2O3) 330200-70-9, Cerium neodymium
zirconium oxide (Ce0.65Nd0.1Zr0.25O2) 375391-12-1,
Neodymium **zirconium oxide** (Nd0.1Zr0.9O2)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(protection layer; **CeO2-ZrO2** solid soln. promoters
modified by Nd for three-way **catalysts**)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(three-way **catalysts**; **CeO2-ZrO2** solid
soln. promoters modified by Nd for)
IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**-ZrO2**; **CeO2-ZrO2** solid soln. promoters
modified by Nd for three-way **catalysts**)
IT **1314-23-4, Zirconium oxide** (**ZrO2**),
uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**CeO2-**; **CeO2-ZrO2** solid soln. promoters
modified by Nd for three-way **catalysts**)

L65 ANSWER 10 OF 16 HCA COPYRIGHT 2003 ACS on STN
132:351857 Microstructure and oxygen release properties of **catalytic**
alumina-supported **CeO2-ZrO2 powders**.
Ozawa, M.; Matuda, K.; Suzuki, S. (CRL, Nagoya Institute of Technology,
Tajimi, Gifu, Japan). Journal of Alloys and Compounds, 303-304, 56-59
(English) **2000**. CODEN: JALCEU. ISSN: 0925-8388. Publisher:
Elsevier Science S.A..
AB This paper describes the phase anal. and oxygen release characteristics of
catalytic mixed oxides in the system of **CeO2-**
ZrO2/Al2O3 heated at 800.degree.. The potential
oxygen storage capacity is improved by the addn. of
ZrO2 to **CeO2** in the case of **alumina**-supported
oxides that are easy to **prep**. by wet impregnation process.
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
ST **alumina** supported **ceria zirconia**
microstructure oxygen release
IT **Catalysts**
(three-way; microstructure and oxygen release properties of
alumina-supported **CeO2-ZrO2**)
IT **1306-38-3, Ceria**, uses **1314-23-4,**
Zirconia, uses **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)

(microstructure and oxygen release properties of **alumina** -supported **CeO2-ZrO2**)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses
RL: CAT (Catalyst use); USES (Uses)
(microstructure and oxygen release properties of **alumina** -supported **CeO2-ZrO2**)

L65 ANSWER 11 OF 16 HCA COPYRIGHT 2003 ACS on STN
132:39723 **Catalyst** for purifying exhaust gas and process for **producing** the same. Takada, Toshihiro (Toyota Jidosha Kabushiki Kaisha, Japan; Toyota Motor Co., Ltd.). Eur. Pat. Appl. EP 963781 A2 **19991215**, 16 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1999-110057 19990521. PRIORITY: JP 1998-154677 19980603.

AB A **catalyst** for purifying an exhaust gas includes a porous oxide support, an O2 storage-and-release material, and a noble metal. The support and the **oxygen storage** -and-release material are **formed** into a composite oxide support. The noble metal is loaded on the composite oxide support. In the **catalyst**, the **fine particles** of the **oxygen storage**-and-release material are trapped in the **fine** compartments of the support, and are prevented from moving when subjected to a high temp. The support exhibits a sp. surface area which decreases less after a high-temp. durability test. The **oxygen storage**-and-release material and the noble metal are kept from growing **granularly** at elevated temps. The **catalyst** maintains the high performance even in high temp.

IC ICM B01D053-94
ICS B01J037-03; B01J023-63; B01J023-89
CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67
ST exhaust gas **catalyst oxygen storage**
IT Exhaust gases (engine)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)
IT Aluminosilicates, uses
Beta zeolites
Ferrierite-type zeolites
Mordenite-type zeolites
Noble metals
Platinum-group metals
Ultrastable Y zeolites
Zeolite ZSM-5
Zeolites (synthetic), uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)
IT **Catalysts**
(**oxygen-storage**; **oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)
IT Hydrocarbons, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(unburnt; **oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)
IT **1306-38-3, Ceria**, uses 1309-48-4, Magnesia, uses
1314-23-4, Zirconia, uses 1332-37-2, Iron oxide, uses
1344-28-1, Alumina, uses 7439-88-5, Iridium, uses

7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-22-4, Silver, uses 7440-74-6, Indium, uses **7631-86-9, Silica**, uses 12789-64-9, Iron **titanium oxide 13463-67-7, Titania**, uses 65453-23-8, Cerium **zirconium oxide**
RL: CAT (Catalyst use); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT 78-10-4, Silicon tetraethoxide 4073-85-2, Aluminum tripropoxide 5593-70-4, Titanium tetrabutoxide 7429-90-5D, Aluminum, alkoxides, uses 7440-21-3D, Silicon, alkoxides, uses 7440-32-6D, Titanium, alkoxides, uses 7440-67-7D, Zirconium, alkoxides, uses 7782-61-8, Iron trinitrate nonahydrate 10294-41-4, Cerium trinitrate hexahydrate 13746-89-9, Zirconium nitrate 13825-74-6, Titanium oxysulfate 14104-77-9, Iron nitrate 17309-53-4, Cerium nitrate 20213-65-4, Zirconyl nitrate dihydrate 22465-17-4, Titanium nitrate
RL: NUU (Other use, unclassified); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT 7782-44-7, Oxygen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT 630-08-0, Carbon monoxide, processes 11104-93-1, Nitrogen oxide, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

IT **1306-38-3, Ceria**, uses **1314-23-4, Zirconia**, uses **1344-28-1, Alumina**, uses **7631-86-9, Silica**, uses **13463-67-7, Titania**, uses
RL: CAT (Catalyst use); USES (Uses)
(**oxygen** and hydrocarbon **storage catalysts** for treating exhaust gases)

L65 ANSWER 12 OF 16 HCA COPYRIGHT 2003 ACS on STN
130:356219 Characterization of model automotive exhaust **catalysts** Pd on **ceria** and **ceria-zirconia** supports. Jen, H.-W.; Graham, G. W.; Chun, W.; McCabe, R. W.; Cuif, J.-P.; Deutsch, S. E.; Touret, O. (Ford Research Laboratory, Dearborn, MI, USA). Catalysis Today, 50(2), 309-328 (English) **1999**. CODEN: CATTEA. ISSN: 0920-5861. Publisher: Elsevier Science B.V..

AB Pure **CeO2**, **SiO2**-doped **CeO2**, **CeO2-ZrO2** solid solns., and CeO2ZrO2 solid solns. with partial incorporation of Pr in the structure were **prepd.** by Rhodia as high-surface area **powders** and used as supports in model Pd automotive three-way **catalysts prepd.** at Ford. The **catalysts** were aged for 12 h at 1050.degree., in air and under redox conditions simulating automotive exhaust gases. Both fresh and aged **catalysts** were characterized by a combination of techniques including **O2 storage** capacity (OSC) measurements. After aging, **catalysts prepd.** on the solid soln. materials provided much greater OSC than those based on pure **CeO2** or **SiO2**-doped **CeO2**. Adding 5 wt. percent Pr7O11 as a substitute for **CeO2** improved the thermal stability of the **CeO2-ZrO2**, without increasing the OSC of the model **catalysts**. **CeO2-ZrO2** based **catalysts** revealed a new temp.-programmed redn. peak, between 100.degree. and

200.degree., after 1050.degree. aging, which is attributed to Pd-assisted bulk redn. of **CeO2**. Significant differences in OSC were noted between **catalysts prepd.** on a series of 70 wt. percent **CeO2**-30 wt. percent **ZrO2** supports **prepd.** by different processes, despite virtually identical characteristics of the aged materials as judged by the other techniques. These observations indicated that different processing methods lead to different phys. and chem. characteristics of aged **catalysts**, not readily discerned by conventional characterization techniques, but nonetheless affecting performance.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST palladium based three way exhaust **catalyst**; **ceria zirconia** supported three way **catalyst**; phys characterization palladium based three way **catalyst**

IT Exhaust gases (engine)
Surface area
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT Hydrocarbons, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT Pore size distribution
(pore vol. and; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **Catalysts**
(three-way, palladium-based; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 7782-44-7, **Oxygen**, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); REM (Removal or disposal); PROC (Process); RACT (Reactant or reagent)
(**catalyst storage** capacity for; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 7440-05-3, Palladium, uses
RL: CAT (Catalyst use); USES (Uses)
(**ceria** and **ceria-zirconia** supported; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **7631-86-9, Silica**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**ceria** doped with; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **12036-32-7**, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 124-38-9, Carbon dioxide, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); POL (Pollutant); FORM (Formation, nonpreparative); OCCU (Occurrence); PROC (Process)

(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 630-08-0, Carbon monoxide, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by **ceria** and; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by pure, **silica**-stabilized, and **zirconia**; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT 1333-74-0, Hydrogen, processes
RL: PEP (Physical, engineering or chemical process); REM (Removal or disposal); PROC (Process)
(uptake; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **7631-86-9, Silica**, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses)
(**ceria** doped with; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **12036-32-7**, Praseodymia
RL: CAT (Catalyst use); USES (Uses)
(characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1314-23-4, Zirconia**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by **ceria** and; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

IT **1306-38-3, Ceria**, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported by pure, **silica**-stabilized, and **zirconia**; characterizing model three-way automotive exhaust **catalysts** contg. palladium on **ceria** and **ceria-zirconia** supports)

L65 ANSWER 13 OF 16 HCA COPYRIGHT 2003 ACS on STN
126:175461 An XRD and TEM investigation of the structure of **alumina**-supported **ceria-zirconia**. Yao, M. H.; Baird, R. J.; Kunz, F. W.; Hoost, T. E. (Physics Dept., Ford Res. Labs., Ford Motor Co., Dearborn, MI, 48121-2053, USA). Journal of Catalysis, 166(1), 67-74 (English) **1997**. CODEN: JCTLA5. ISSN: 0021-9517. Publisher: Academic.

AB Dispersed **CeO2-ZrO2** is of interest as a thermally stable **oxygen-storage** component of automotive **catalysts**. **Alumina**-supported **CeO2-ZrO2** samples were **prepd.** by co-impregnation in order to maximize the interaction between Zr and Ce. The phases present, their

particle sizes and the interactions among the phases of fresh, steam-aged and reduced samples were investigated by XRD and TEM. In the fresh samples, a **particulate** solid soln. phase ZrxCe1-xO2 of cubic symmetry was identified. However, the zirconium concn. of this **particulate** phase was found to be smaller than that expected from the Zr loading. This suggests the existence of finely dispersed **zirconia** on the **Al2O3** surface. For the steam-aged samples, a second Ce-**Zr oxide** solid soln. phase of higher Zr concn. and tetragonal symmetry was found in addn. to the original **CeO2**-based cubic solid soln. The appearance of this second phase may have resulted from sintering of the highly dispersed ~~zirconia. The~~ highly dispersed **zirconia** may ~~a~~lso be responsible for preventing reaction between **CeO2** and the **Al2O3** support, since CeAlO3 was found only in high-temp. reduced samples without **zirconia**. The **particle** sizes of the various phases were measured by XRD and TEM. The **particle** size of the supported **particulate** phase decreased with increasing zirconium loading, but a discrepancy was noted between the XRD and the TEM results. This discrepancy is discussed in terms of compositional inhomogeneity in the ZrxCe1-xO2 solid soln. phase.

CC 57-2 (Ceramics)
Section cross-reference(s): 67

ST **alumina** supported **ceria zirconia** automotive **catalyst**

IT **Catalysts**
(automotive; **prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

IT Microstructure
Particle size
(**prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

IT Aging, materials
(steam; **prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

IT **1306-38-3, Cerium oxide (CeO2)**, processes **1314-23-4, Zirconia**, processes **1344-28-1, Alumina**, processes 65453-23-8, Cerium **zirconium oxide**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

IT **1306-38-3, Cerium oxide (CeO2)**, processes **1314-23-4, Zirconia**, processes **1344-28-1, Alumina**, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**prepn.** and structure of **alumina**-supported **ceria-zirconia** in relation to automotive **catalysts**)

L65 ANSWER 14 OF 16 HCA COPYRIGHT 2003 ACS on STN
125:122168 **Catalyst** for treatment of exhaust gases and its **manufacture**. Kimura, Mareo; Matsuoka, Yoriko; Sobukawa, Hideo; Fukui, Masayuki; Suda, Akihiko; Kandori, Toshio; Ukyo, Yoshio (Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan). Eur. Pat. Appl. EP 715879 A1

19960612, 19 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1995-119403 19951208. PRIORITY: JP 1994-306265 19941209; JP 1995-113789 19950413.

AB The **catalyst** comprises **cerium oxide** or a solid soln. contg. **cerium oxide** and **zirconium oxide**, and noble metal loaded on porous support. The **cerium oxide** or the solid soln. has an av. **particle** diam. of 5-100 nm. The **cerium oxide** is present in the solid soln. at 0.2-4.0 molar ratio with respect to the **zirconium oxide**. The **catalyst** can be **prepd.** by coating the support with a slurry of a **cerium oxide** sol, or a **cerium oxide** sol and a **zirconium oxide** sol, calcining the slurry, and loading noble metal. The **cerium oxide** or its solid soln. has a surface area large enough to effect an **oxygen storage** function, and has an av. **particle** diam. large enough to prevent the same from entering deeply into fine pores of a porous support, thereby providing a **catalyst** fully exhibiting both of the **oxygen storage** capability and the **catalytic** activity.

IC ICM B01D053-94
ICS B01J023-56; B01J021-06; B01J023-63

CC 59-3 (Air Pollution and Industrial Hygiene)

ST exhaust gas treatment **catalyst manuf**

IT Exhaust gases
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT Platinum-group metals
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT **Catalysts** and **Catalysis**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT Hydrocarbons, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT **1314-23-4, Zirconium oxide (ZrO2)**, uses **1344-28-1, Alumina**, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses **7631-86-9, Silica**, uses 11129-18-3, **Cerium oxide 13463-67-7, Titania**, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT 630-08-0, Carbon monoxide, processes 10102-43-9, Nitrogen oxide (NO), processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(**catalyst** for treatment of exhaust gases and its **manuf.**)

IT 56-81-5, 1,2,3-Propanetriol, processes 107-21-1, 1,2-Ethanediol, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(reducing agent; **catalyst** for treatment of exhaust gases and its **manuf.**)

IT **1314-23-4, Zirconium oxide (ZrO2)**,

uses **1344-28-1, Alumina**, uses **7631-86-9, Silica**, uses **13463-67-7, Titania**, uses
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** for treatment of exhaust gases and its **manuf**.)

L65 ANSWER 15 OF 16 HCA COPYRIGHT 2003 ACS on STN
114:69843 **Oxygen storage** capacity of **cerium oxides** in **ceria/alumina** containing precious metals. Miki, Takeshi; Haneda, Masaaki; Kakuta, Noriyoshi; Ueno, Akifumi; Tateishi, Syuji; Matsuura, Shinji; Sato, Masayasu (Dep. Mater. Sci., Toyohashi Univ. Technol., Toyohashi, 440, Japan). Shokubai, 32(6), 422-5 (Japanese) **1990**. CODEN: SHKUAJ. ISSN: 0559-8958.
AB Addn. of precious metals (PM; Pt, Rh) on **CeO2/Al2O3** and **CeO2/La2O3/Al2O3** enhanced their O storage capacities (OSC). Increments in the OSC of the **CeO2/La2O3/Al2O3 catalysts** were much greater than those in the **CeO2/Al2O3** samples. The enhanced OSC is ascribed to the interaction between PM and a **CeO2-La2O3** solid soln. **formed** during **catalyst prepn**. No enhancements in the OSC were obsd. on phys. mixing of **CeO2/La2O3/Al2O3** and Pt-Rh/**Al2O3**, although the compn. ratio of PM:**CeO2**:**La2O3** was the same. This indicates that the intimate contacts between the precious metals and **CeO2 particles** dispersed on **Al2O3** are essential for the enhanced OSC of **CeO2**.
CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
ST **oxygen storage** platinum rhodium **ceria alumina**; platinum **ceria** lanthana **alumina catalyst**; rhodium **ceria** lanthana **alumina catalyst**
IT **Catalysts** and **Catalysis**
(**ceria**-lanthana-**alumina**, **oxygen storage** capacity of, effects of addn. of platinum or rhodium on)
IT Adsorption
(of oxygen, on **ceria**-lanthana-**alumina catalyst**, effects of addn. of platinum or rhodium on)
IT 7782-44-7, Oxygen, properties
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(adsorption of, on **ceria**-lanthana-**alumina catalyst**, effect of addn. of platinum or rhodium on)
IT 1312-81-8, Lanthanum sesquioxide
RL: CAT (Catalyst use); ~~USES (Uses)~~
(**catalyst** from **ceria** and **alumina** and, effect of addn. of platinum or rhodium on **oxygen storage** capacity of)
IT 7440-06-4, Platinum, uses and miscellaneous 7440-16-6, Rhodium, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** from **ceria** and lanthana and **alumina** and, **oxygen storage** capacity of)
IT **1306-38-3, Cerium dioxide**, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(**catalyst** from lanthana and **alumina** and, effect of addn. of platinum or rhodium on **oxygen storage** capacity of)
IT **1306-38-3, Cerium dioxide**, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)
(**catalyst** from lanthana and **alumina** and, effect of addn. of platinum or rhodium on **oxygen storage** capacity of)

L63 ANSWER 16 OF 16 HCA COPYRIGHT 2003 ACS on STN
113:84018 Enhanced **oxygen storage** capacity of **cerium oxides** in **cerium dioxide/lanthanum** sesquioxide/**alumina** containing precious metals. Miki, Takeshi; Ogawa, Takao; Haneda, Masaaki; Kakuta, Noriyoshi; Ueno, Akifumi; Tateishi, Syuji; Matsuura, Shinji; Sato, Masayasu (Dep. Mater. Sci., Toyohashi Univ. Technol., Toyohashi, 440, Japan). Journal of Physical Chemistry, 94(16), 6464-7 (English) **1990**. CODEN: JPCHAX. ISSN: 0022-3654.

AB The addn. of precious metals (PM: Pt, Rh) on **CeO2/Al2O3** and **CeO2/La2O3/Al2O3** increased the O storage capacities (OSC). Increments in the OSC of the PM-doped **CeO2/La2O3/Al2O3 catalysts** were much greater than those in the OSC of the PM-doped **CeO2/Al2O3**. The enhanced OSC is ascribed to the interaction between the PM and a **CeO2-La2O3** solid soln. **formed** during the **catalyst prepn.** No enhancements in the OSC were obsd. on phys. mixing of **CeO2/La2O3/Al2O3** and Pt-Rh/**Al2O3**, although the compn. ratio of the PM:**CeO2**:**La2O3** phys. mixt. is the same as that in the PM-doped **CeO2/La2O3/Al2O3**. This indicates that the intimate contacts between the precious metals and **CeO2 particles** dispersed on **Al2O3** are essential for the enhanced OSC of **Ce oxides**.

CC 59-3 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 51, 67

ST **oxygen storage** capacity exhaust **catalyst**; **cerium oxide** exhaust **catalyst** oxygen; **lanthanum oxide** exhaust **catalyst** oxygen; platinum exhaust **catalyst** oxygen capacity; rhodium exhaust **catalyst** oxygen capacity

IT Exhaust gases
(**catalysts** for treatment of, three-way, **cerium oxide** and **cerium oxide-lanthanum** sesquioxide, **oxygen storage** capacity of, enhancement of, by addn. of platinum and rhodium)

IT Oxidation **catalysts**
Reduction **catalysts**
(**cerium oxide** and **cerium oxide-lanthanum** sesquioxide, for exhaust gas treatment, **oxygen storage** capacity of, enhancement of, by addn. of platinum and rhodium)

IT **Catalysts** and **Catalysis**
(three-way, **cerium oxide** and **cerium oxide-lanthanum** sesquioxide, for exhaust gas treatment, **oxygen storage** capacity of, enhancement of, by addn. of platinum and rhodium)

IT **1306-38-3**, **Cerium oxide (CeO2)**, uses and miscellaneous **1306-38-3D**, **Cerium oxide (CeO2)**, solid solns. with **lanthanum oxide** 1312-81-8D, **Lanthanum oxide (La2O3)**, solid solns. with **cerium oxide**
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**, on **alumina** support, for exhaust gas treatment, **oxygen storage** capacity of, enhancement

of, by platinum-rhodium addn.)
IT 7440-06-4, Platinum, uses and miscellaneous
RL: USES (Uses)
(**cerium oxide** and **cerium oxide-lanthanum** sesquioxide exhaust gas treatment **catalyst** doping with rhodium and, for enhanced **oxygen storage** capacity)
IT 7440-16-6, Rhodium, uses and miscellaneous
RL: USES (Uses)
(**cerium oxide** and **cerium oxide-lanthanum** sesquioxide exhaust gas treatment **catalysts** doping with platinum and, for enhanced **oxygen storage** capacity)
IT 7782-44-7, Oxygen, uses and miscellaneous
RL: USES (Uses)
(storage capacity for, of **cerium oxide** and **cerium oxide-lanthanum** sesquioxide exhaust gas treatment **catalysts**, enhancement of, by addn. of platinum and rhodium)
IT **1306-38-3, Cerium oxide (CeO2)**, uses and miscellaneous **1306-38-3D, Cerium oxide (CeO2)**, solid solns. with **lanthanum oxide**
RL: CAT (Catalyst use); USES (Uses)
(**catalysts**, on **alumina** support, for exhaust gas treatment, **oxygen storage** capacity of, enhancement of, by platinum-rhodium addn.)

=> d L102 1-8 ti

L102 ANSWER 1 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI **Catalyst** compsn. used for motor vehicle post-combustion **catalysis** - is based on **cerium oxide** and at least one other oxide chosen from iron, manganese and **praseodymium oxide**(s).

L102 ANSWER 2 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Composite oxide which **absorbs** and desorbes **oxygen**, used as functional oxide and **catalyst** purifying exhaust gas - comprises **cerium oxide, zirconium oxide**, hafnium oxide and additional metal oxide and includes phi-phase as a crystal phase..

L102 ANSWER 3 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Cpd. oxide to **absorb** and desorb **oxygen** - comprising **cerium oxide, zirconium oxide**, hafnium oxide and opt. further oxide of, e.g., tungsten or iron, has improved capability and durability at higher temp..

L102 ANSWER 4 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Composite oxide having oxygen absorption-emission capability - contg. **cerium oxide** and **europium oxide** at controlled ratio, useful as **catalyst** and ceramic.

L102 ANSWER 5 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Heat resistant **catalyst** for purifying exhaust gas - comprising platinum, palladium and/or rhodium on support of **alumina**, ceria

and **zirconia** with high **oxygen storage** capacity.

L102 ANSWER 6 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI **Catalyst** for purifying exhaust gas comprising a monolithic support - platinum gp. element, active **alumina**, **cerium oxide**, barium cpd. and zirconium cpd..

L102 ANSWER 7 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Supported **catalyst** for exhaust gas purificn. - with perovskite double oxide layer contg. noble metal on surface of support.

L102 ANSWER 8 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
TI Gas detector activated by voltage change - comprises wire coil coated with sintered metal oxide e.g. **titanium di oxide**, **zirconium di oxide**, hafnium di oxide, yttria and ceria.

=> d L102 1-8 all

L102 ANSWER 1 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1996-342090 [34] WPIX
DNC C1996-108638
TI **Catalyst** compsn. used for motor vehicle post-combustion **catalysis** - is based on **cerium oxide** and at least one other oxide chosen from iron, manganese and **praseodymium oxide**(s).
DC H06 J04
IN BLANCHARD, G; QUEMERE, E; TOURET, O; VISCIGLIO, V
PA (RHON) RHONE POULENC CHIM; (RHON) RHONE-POULENC CHIM; (RHOD) RHODIA CHIM
CYC 25
PI WO 9621506 A1 19960718 (199634)* FR 24p B01J023-83
RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
W: AU BR CA CN FI JP KR US
FR 2729309 A1 19960719 (199636) 17p B01J023-10
AU 9644921 A 19960731 (199645) B01J023-83
ZA 9600246 A 19961030 (199649) 32p F01N000-00
EP 802824 A1 19971029 (199748) FR B01J023-83
R: AT BE DE FR GB IT
JP 10505786 W 19980609 (199833) 24p B01D053-94
EP 802824 B1 19990324 (199916) FR B01J023-83
R: AT BE DE FR GB IT
KR 98701391 A 19980515 (199918) B01J023-83
DE 69601860 E 19990429 (199923) B01J023-83
JP 2930732 B2 19990803 (199936) 8p B01D053-94
US 5976476 A 19991102 (199953) B01J008-02
KR 237812 B1 20000115 (200114) B01J023-83
CN 1173832 A 19980218 (200170) B01J023-83
ADT WO 9621506 A1 WO 1996-FR39 19960110; FR 2729309 A1 FR 1995-344 19950113; AU 9644921 A AU 1996-44921 19960110; ZA 9600246 A ZA 1996-246 19960112; EP 802824 A1 EP 1996-901040 19960110, WO 1996-FR39 19960110; JP 10505786 W JP 1996-521481 19960110, WO 1996-FR39 19960110; EP 802824 B1 EP 1996-901040 19960110, WO 1996-FR39 19960110; KR 98701391 A WO 1996-FR39 19960110, KR 1997-704780 19970712; DE 69601860 E DE 1996-601860 19960110, EP 1996-901040 19960110, WO 1996-FR39 19960110; JP 2930732 B2 JP 1996-521481 19960110, WO 1996-FR39 19960110; US 5976476 A WO 1996-FR39 19960110, US 1997-860955 19970909; KR 237812 B1 WO 1996-FR39 19960110, KR 1997-704780 19970712; CN 1173832 A CN 1996-191892 19960110
FDT AU 9644921 A Based on WO 9621506; EP 802824 A1 Based on WO 9621506; JP

10505786 W Based on WO 9621506; EP 802824 B1 Based on WO 9621506; KR 98701391 A Based on WO 9621506; DE 69601860 E Based on EP 802824, Based on WO 9621506; JP 2930732 B2 Previous Publ. JP 10505786, Based on WO 9621506; US 5976476 A Based on WO 9621506
PRAI FR 1995-344 19950113
REP EP 514177; EP 525677; EP 588691; EP 624399; US 4499324
IC ICM B01D053-94; B01J008-02; B01J023-10; B01J023-83; F01N000-00
ICS B01D053-52; B01J023-34; B01J023-76; B01J031-00; C01B017-16; C01G045-02
ICI B01J023-10, B01J103:66
AB WO 9621506 A UPAB: 19960829
A new **catalytic** compsn. based on **CeO2** and at least one oxide from Fe, Mn and Pr is claimed.
Also claimed are the prepn. and the use of the new **catalysts**.

The compsn. may be prepd. in one of the following ways:
(a) Prepn. of a liq. mixt contg. a cpd. of Ce and at least one cpd. of Fe, Mn or Pr, heating the mixt., and recovery and calcination of the ppte.;
(b) Prepn. of a liq. mixt contg. a cpd. of Ce and at least one cpd. of Fe, Mn or Pr, addn. of a basic cpd. to form a ppte., and recovery and calcination of the ppte..
(c) Prepn. of a mixt. comprising a Ce sol and at least one cpd. of Fe, Mn or Pr, drying by atomisation, and calcination of the dried product.
(d) Impregnation of an oxide of Ce with a soln. of a cpd. of Fe, Mn or Pr, then calcination of the oxide.
H2O2 may be added to the prepd. mixt. before or after heating.
USE - The **catalyst** compsn. is used in automobile post-combustion to suppress the emission of H2S, which can be produced when emitted exhaust gases are reductive. Environmentally it is desirable that H2S be eliminated.
ADVANTAGE - The oxides of Ce are readily available and have a high surface area, i.e. 80-300 m2/g. The compsn. can be produced in the form of particles, balls, etc., of varying size and applied on any support such as **ZrO2, Al2O3, TiO2**, etc.. They can also be applied in systems comprising a wash-coat on a metallic or ceramic monolithic substrate. The compsns. can also be used in combination with a precious metal, e.g. Pt, Rh, etc.. The compsns. have a high chemical homogeneity; areas of homogeneity are less than 10 mm2. They have a good capacity to **store O2**, even after exposure to high temps.. Generally, after calcination for 6 h in air at 900deg.C, the compsns. contain at least 1 ml O2/g, more partic. 1.5 ml O2/g.
Dwg.0/0
FS CPI
FA AB
MC CPI: H06-C04; J04-E04

L102 ANSWER 2 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1996-189900 [20] WPIX
CR 1995-024061 [04]; 1996-201970 [21]
DNC C1996-060686
TI Composite oxide which **absorbs** and desorbes **oxygen**, used as functional oxide and **catalyst** purifying exhaust gas - comprises **cerium oxide, zirconium oxide**, hafnium oxide and additional metal oxide and includes phi-phase as a crystal phase..
DC E36 H06 J01 J04 L02
IN YAO, S; YOKOI, H; AOZASA, S; MUROTA, T; YAMAMOTO, K
PA (SANT-N) SANTOKU METAL IND CO LTD; (SANT-N) SANTOKU KINZOKU KOGYO KK
CYC 9

PI EP 706980 A1 19960417 (199620)* EN 8p C04B035-486
R: BE DE FR GB IT
JP 08109021 A 19960430 (199627) 7p C01G025-00
US 5580536 A 19961203 (199703) 7p C01F017-00
CN 1133820 A 19961023 (199803) C01F017-00
EP 706980 B1 20000517 (200028) EN C04B035-486
R: BE DE FR GB IT
DE 69516968 E 20000621 (200037) C04B035-486
KR 185483 B1 19990415 (200051) B01J023-10
ADT EP 706980 A1 EP 1995-307050 19951004; JP 08109021 A JP 1994-241663 19941005; US 5580536 A CIP of US 1994-263608 19940620, US 1995-537629 19951002; CN 1133820 A CN 1995-119163 19951005; EP 706980 B1 EP 1995-307050 19951004; DE 69516968 E DE 1995-616968 19951004, EP 1995-307050 19951004; KR 185483 B1 KR 1995-34068 19951005
FDT US 5580536 A CIP of US 5478543; DE 69516968 E Based on EP 706980
PRAI JP 1994-241663 19941005; JP 1993-149358 19930621
IC ICM B01J023-10; C01F017-00; C01G025-00; C04B035-486
ICS B01J020-02; C01B013-00; C01G041-00; C01G049-00; C01G053-00; C04B035-48; C04B035-50
AB EP 706980 A UPAB: 20001016
A composite oxide having **oxygen absorbing** and desorbing capability, comprising 4.99-98.89 wt.% **CeO2**, 1-95 wt.% **ZrO2**, 0.01-20 wt.% HfO2, and 0.1-10 wt.% of an additional metal oxide, where the composite oxide includes phi-phase as a crystal phase and has an **oxygen absorbing** and desorbing capability of at least 100 micro mols. per gram at 400-700 deg.C.
USE The present invention relates to a composite oxide having **oxygen absorbing** and desorbing capabilities for use as a functional ceramic material and for a **catalyst** for purifying exhaust gases.
Dwg.0/2
FS CPI
FA AB; DCN
MC CPI: E11-Q02; E31-D02; E35-L; J01-D01; J01-E02D; J04-E04; L02-G; L02-J02C

L102 ANSWER 3 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1995-024061 [04] WPIX
CR 1996-189900 [20]; 1996-201970 [21]
DNC C1995-011077
TI Cpd. oxide to **absorb** and desorb **oxygen** - comprising **cerium oxide, zirconium oxide,** hafnium oxide and opt. further oxide of, e.g., tungsten or iron, has improved capability and durability at higher temp..
DC E36 E37 H06 J01 J04 L02
IN AOZASA, S; MUROTA, T; YAMAMOTO, K; YAO, S; YOKOI, H
PA (SANT-N) SANTOKU METAL IND CO LTD; (SANT-N) SANTOKU KINZOKU KOGYO KK
CYC 8
PI EP 629438 A2 19941221 (199504)* EN 4p B01J023-10
R: BE DE FR GB IT
JP 07016452 A 19950120 (199513) 4p B01J020-06
US 5478543 A 19951226 (199606) 4p C01F017-00
EP 629438 A3 19950614 (199610) B01J023-10
US 5580536 A 19961203 (199703) 7p C01F017-00
US 5582785 A 19961210 (199704) 12p C04B037-00
JP 3041662 B2 20000515 (200028) 4p B01J020-06
KR 194266 B1 19990615 (200059) B01J023-10
ADT EP 629438 A2 EP 1994-304411 19940617; JP 07016452 A JP 1993-149358 19930621; US 5478543 A US 1994-263608 19940620; EP 629438 A3 EP 1994-304411 19940617; US 5580536 A CIP of US 1994-263608 19940620, US 1995-537629 19951002; US 5582785 A CIP of US 1994-263608 19940620, US

1995-537636 19951002; JP 3041662 B2 JP 1993-149358 19930621; KR 194266 B1 KR 1994-14012 19940621
FDT US 5580536 A CIP of US 5478543; US 5582785 A CIP of US 5478543; JP 3041662 B2 Previous Publ. JP 07016452
PRAI JP 1993-149358 19930621; JP 1994-241663 19941005; JP 1994-241662 19941005
REP 1.Jnl.Ref; US 4927799; US 4971933; US 5198596
IC ICM B01J020-06; B01J023-10; C01F017-00; C04B037-00
ICS B01J023-76; C01B013-00; C01G025-00; C04B035-48
ICA C04B035-00
AB EP 629438 A UPAB: 20001117
Cpd. capable of absorbing and desorbing at least 100 micro-mol/g oxygen at 400-700 deg. C, and having a surface area of at least 10 m2/g after 5 hrs. at 900 deg. C, comprises (wt.%) 4.99-98.99 **cerium oxide**, 1-95 **zirconium oxide** and 0.01-20 hafnium oxide.
ADVANTAGE - The cpd. has enhanced oxygen absorption/desorption at 400-700 deg. C, and retains a high surface area to higher temps., compared to the conventional **cerium oxide** as a **catalyst** or a ceramic.
Dwg.0/0
FS CPI
FA AB
MC CPI: H06-C03; J04-E04; L02-G; N03-A; N03-B02

L102 ANSWER 4 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1993-364942 [46] WPIX
DNC C1993-161634
TI Composite oxide having oxygen absorption-emission capability - contg. **cerium oxide** and **europium oxide** at controlled ratio, useful as **catalyst** and ceramic.
DC E36 J01 J04 L02
PA (SANT-N) SANTOKU KINZOKU KOGYO KK
CYC 1
PI JP 05270823 A 19931019 (199346)* 4p C01F017-00
ADT JP 05270823 A JP 1992-65045 19920323
PRAI JP 1992-65045 19920323
IC ICM C01F017-00
ICS B01D053-14; B01D053-36; B01J020-06; B01J023-10; B01J023-30; B01J023-76; B01J023-78; C01G001-00
AB JP 05270823 A UPAB: 19940103
Composite oxide having oxygen absorption/emission capability, contains **Ce oxide** and **Eu oxide**, and has oxygen absorption/emission capability of more than 100 micro mol/1 at below 400 deg.C, and contains more than 0.1 wt.% **Eu oxide** w.r.t. total .
Pref. composite oxide further contains **Zr oxide**, **Ti oxide**, W oxide, NiO, Cu oxide, Fe oxide, **Al2O3**, **Si oxide**, BeO oxide, MgO oxide, CaO oxide, SrO, BaO, RaO, and an oxide of a rare earth metal except for Ce.
A soln. contg. Ca ions and Eu ion is mixed with an ammonia aq soln in aq soln of ammonium bicarbonate, or an oxalate aq soln. to prepare a composite salt precipitate contg. Ce and Eu. The composite salt precipitate is fired at higher than 300 deg.C. USE/ADVANTAGE - A composite oxide having oxygen absorption/emission capacity of more than 100 umol/g at below 400 deg C is provided. The composite oxide is useful as a substitute for **cerium oxide** for **catalyst** and ceramics.
Dwg.0/0
FS CPI
FA AB; DCN

MC CPI: E31-D01; E34-E; J04-E04; L02-G; N03-A

L102 ANSWER 5 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1992-060010 [08] WPIX
DNC C1992-027063
TI Heat resistant **catalyst** for purifying exhaust gas - comprising platinum, palladium and/or rhodium on support of **alumina**, ceria and **zirconia** with high **oxygen storage** capacity.
DC H06 J04 L02
PA (NSMO) NISSAN MOTOR CO LTD
CYC 1
PI JP 04004043 A 19920108 (199208)*
PRAI JP 1990-103192 19900420
IC B01D053-36; B01J023-56
AB JP 04004043 A UPAB: 19931006
Catalyst comprises a supporting layer and a metal. The supporting layer contains **Al2O3, Ce oxide** and **Zr oxide** obtd. by coprecipitation in a compsn. of (X wt. % (**CeO2.ZrO2**).**Al2O3**) (I) and have good **O2 storage** capacity after using for a long time. The metal is at least one of Pt, Pd and Rh. (In (I) X wt. % = 5-40. The ratio of total wt. of **CeO2** and **ZrO2** to those of **CeO2, ZrO2** and Al 2O3 and the wt. ratio of **CeO2** to **ZrO2** is 70:30 to 20:80.
ADVANTAGE - **Catalyst** has high activity after being used for a long time at high temp. The support has high **O2 storage** capacity and a large specific surface area.
In an example, 600g Al(NO3)3.9H2O and 200g water were charged into a 6l plastic vessel. After stirring for 30 mins at a room temp. 41.6g aq. Ce(NO3)2 soln. (Ce concn. = 18.7 wt.%) and 70.7g aq. Zr(NO3)2 soln. (Zr concn. = 18.5 wt.%) were added to the soln. and the soln. was stirred for 120 mins. 5 mol/l NH3 aq. soln. was then added until pH became 9 and a hydroxide ppte. was obtd. by suction filtration. The ppte. was dried at 150 deg.F for 15 hrs in an oven and then sintered at 500 deg.C for 2 hrs in an air stream to prepare the composite oxide. By using Pt dinitrodiamine soln., Pt was impregnated into the composite oxide in such an amt. that the concn. was 1.0 wt.%. The composite oxide was dried at 150 deg.C for 4 hrs, sintered at 400 deg.C. for 2 hrs in an air stream and further sintered at 880 deg.C to prepare the **catalyst**.
0/1
FS CPI
FA AB
MC CPI: H06-C03; J01-E02D; J04-E04; L02-G; N01-C02; N02-E; N02-F02; N03-A; N03-B

L102 ANSWER 6 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1989-062772 [09] WPIX
DNC C1989-027686
TI **Catalyst** for purifying exhaust gas comprising a monolithic support - platinum gp. element, active **alumina**, **cerium oxide**, barium cpd. and zirconium cpd..
DC H04 J04
IN FUNABIKI, M; YAMADA, T
PA (ENGH) ENGELHARD CORP; (NECH-N) NE CHEMCAT KK
CYC 19
PI EP 305119 A 19890301 (198909)* EN 15p
R: AT BE CH DE ES FR GB GR IT LI LU NL SE
JP 01058347 A 19890306 (198915)
SE 8802998 A 19890301 (198916)

AU 8821611	A	19890302 (198918)			
FI 8803971	A	19890301 (198922)			
US 4965243	A	19901023 (199045)	7p		
CA 1318310	C	19930525 (199326)		B01J023-58	
JP 05168926	A	19930702 (199331)	12p	B01J023-58	
EP 305119	B1	19940727 (199429) EN	17p	B01J023-54	
R: AT BE CH DE ES FR GB GR IT LI LU NL SE					
DE 3850827	G	19940901 (199434)		B01J023-54	
ES 2056934	T3	19941016 (199442)		B01J023-54	
FI 93084	B	19941115 (199445)		B01J023-56	
JP 2537239	B2	19960925 (199643)	9p	B01J023-58	
JP 2581872	B2	19970212 (199711)	12p	B01J023-58	
KR 9612558	B1	19960923 (199926)		B01D053-34	

ADT EP 305119 A EP 1988-307698 19880819; JP 01058347 A JP 1987-213159 19870828; US 4965243 A US 1990-478040 19900209; CA 1318310 C CA 1988-575880 19880826; JP 05168926 A Div ex JP 1987-213159 19870828, JP 1992-148025 19870828; EP 305119 B1 EP 1988-307698 19880819; DE 3850827 G DE 1988-3850827 19880819, EP 1988-307698 19880819; ES 2056934 T3 EP 1988-307698 19880819; FI 93084 B FI 1988-3971 19880826; JP 2537239 B2 JP 1987-213159 19870828; JP 2581872 B2 Div ex JP 1987-213159 19870828, JP 1992-148025 19870828; KR 9612558 B1 KR 1988-10951 19880827

FDT DE 3850827 G Based on EP 305119; ES 2056934 T3 Based on EP 305119; FI 93084 B Previous Publ. FI 8803971; JP 2537239 B2 Previous Publ. JP 01058347; JP 2581872 B2 Previous Publ. JP 05168926

PRAI JP 1987-213159 19870828

REP A3...9006; EP 75124; FR 2210434; FR 2449475; GB 2142253; No-SR.Pub; US 4316822; US 4367162

IC B01D053-36; B01J021-04; B01J023-58; B01J035-04
ICM B01D053-34; B01J023-54; B01J023-56; B01J023-58
ICS B01D053-94; B01J021-04; B01J035-04

ICA B01D053-36

AB EP 305119 A UPAB: 19930923

A **catalyst** for purifying exhaust gas comprises a monolithic support carrying, as **catalyst** ingredients, (a) a Pt gp. element, (b) active **Al2O3**, (c) **CeO2**, (d) a Ba cpd., and (e) a Zr cpd.

The support has a honeycomb or 3-dimensional network structure, and is of cordierite or a refractory metal. (a) Pt, 0.1-10 g/l, and 0.02-2 g/l of finished **catalyst** of Rh are pref. The amt. of (b) is 30-200 g/l, and of (c) is 10-150 g/l. (b) Ba(OH)2, BaO and/or BaCO3 are pref.; the amt. is 0.1-20 g/l calc. as BaO. (e) **ZrO2**, 0.1-30 g/l, is pref.

The **catalyst** is prepd. by (i) prepg. active Al2O3 contg. the Pt gp. element, (ii) prepg. a slurry contg. the Pt gp. element, active Al2O3, CeO2, the Ba cpd. (pref. Ba(OH)2), and the Zr cpd. (pref. 0.1-30 g/l of zirconyl acetate), (iii) depositing the slurry on the support, and (iv) calcining.

ADVANTAGE - The **catalyst** has better activity after prolonged exposure to 900-1100 deg.C, e.g. immediately below the manifold. Addn. of Ba and Zr cpds. inhibits sintering of the Pt gp. element and **CeO2** and maintains the **O2 storage** effect of **CeO2**.

0/0

FS CPI

FA AB

MC CPI: H06-C03; J01-E02D; J04-E04; N01-B; N01-C02; N02-E; N02-F02; N03-A; N03-B

L102 ANSWER 7 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1988-085545 [13] WPIX

DNC C1988-038325
TI Supported **catalyst** for exhaust gas purificn. - with perovskite double oxide layer contg. noble metal on surface of support.
DC E36 H06 J01 J04 Q51
IN MATSUMOTO, S; MIYOSHI, N; TAKADA, T
PA (TOYT) TOYOTA JIDOSHA KK
CYC 5
PI DE 3726580 A 19880324 (198813)* 7p
JP 63077543 A 19880407 (198820)
US 4849398 A 19890718 (198936) 6p
DE 3726580 C 19900802 (199031)
JP 05082259 B 19931118 (199349) 5p B01J023-58
ADT DE 3726580 A DE 1987-3726580 19870810; US 4849398 A US 1987-82533 19870807; JP 05082259 B JP 1986-218765 19860917
FDT JP 05082259 B Based on JP 63077543
PRAI JP 1986-218765 19860917
IC B01D053-36; B01J023-54; F01N003-10
ICM B01J023-58
ICS B01D053-36; B01J023-54; F01N003-10
AB DE 3726580 A UPAB: 19930923
Supported **catalyst** for exhaust gas purificn. has a support with a perovskite double oxide, consisting of at least one alkaline earth **oxide**, **La oxide** and **Ce oxide** on the surface and noble metal **catalyst** components.
Pref. the support has an **alumina** coating, in which the perovskite double oxide and noble metal **catalyst** components are formed. The alkaline earth metal oxide is Mg, Ca, Sr or Ba oxide, esp. BaO; and the noble metal is Pt, Pd and/or Rh, esp. Pt and Pd.
USE/ADVANTAGE - The exhaust gas purificn. property (for CO, hydrocarbons and NOx) and heat resistance are better than usual.
0/3
FS CPI GMPI
FA AB; DCN
MC CPI: E10-J02C; E10-J02D; E11-Q01; E11-Q02; E31-H01; E31-N05B; H06-C03; J01-E02D; J04-E03; J04-E04; N01-B; N02-E; N02-F; N03-A

L102 ANSWER 8 OF 8 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN
AN 1978-74846A [42] WPIX
TI Gas detector activated by voltage change - comprises wire coil coated with sintered metal oxide e.g. **titanium di oxide**, **zirconium di oxide**, hafnium di oxide, yttria and ceria.
DC J04 L03 S03
PA (SHIB-N) SHIBAURA DENSHI SEISAKUSHO KK
CYC 1
PI JP 53102798 A 19780907 (197842)*
PRAI JP 1977-17877 19770221
IC G01N027-16
AB JP 53102798 A UPAB: 19930901
Gas detector is mfd. by applying directly >=1 metal oxide powder from **TiO2**, **ZrO2**, HfO2, **Y2O3**, **CeO2**, NiO and Cr2O3 to a metallic wire coil which is hardly oxidised at high temp., and sintering the metal oxide powder by passing electric current through the metallic wire coil in an inert gaseous flow contg. >=10% **oxygen** to **hold** the average temp. of the metallic wire coil >1,000 degrees C and below the m.pt. of the wire coil.
The detector is inexpensive and has high sensitivity to gas (e.g. isobutane, hydrogen, acetylene, etc.), high strength, resistance to **catalyst** poisons, such as silicone, arsenic cpd., cyanide cpd., etc. and high reliability.

FS CPI EPI
FA AB
MC CPI: J04-C04; L03-B01A